261

PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO

CONTENTS

TRADE NAME	MODEL	SET AND FOLDER No.
Admiral	4X11, 4X12, 4X18, 4X19 (Ch. 4X1)	261-1
Arvin	858T, 859T (Ch. RE374)	261-2
Browning	RJ-48	261-3
Capehart	2T55 (Ch. CR-154), 3T55E (Ch. CR-150)	261-4
CBS Columbia	5220	261-5
David Bogen	B1B-1 (TV Booster)	261-6
General Electric	630, 631, 632	261-7
Monitoradio	DR-200, DRS-1	261-8
Motorola	504	261-9
Oldsmobile	983091	261-10
Philco	B569 (Code 121)	261-11
RCA Victor	4-Y-511 (Ch. RC1134)	261-12
Raytheon	M-1750A, C, G, K, M-1751D, F, M-1752E, L, M-2160A, C, G, K, M-2161D, F, M-2162E, L, (Ch. 17T18, 21T19) Tel. Rec.	261-13
Truetone	D2483	261-14
Truetone	2D1431A Tel. Rec.	261-15
Walsco	2000 UHF Conv.	261-16
Zenith	M2237EU, EZ, R, RU, RZ, M2260R, RU, RUZ, RZ, M2261E, EU, EZ, M2267YU, YZ (Ch. 20M20, U, Z) Tel. Rec.	261-17

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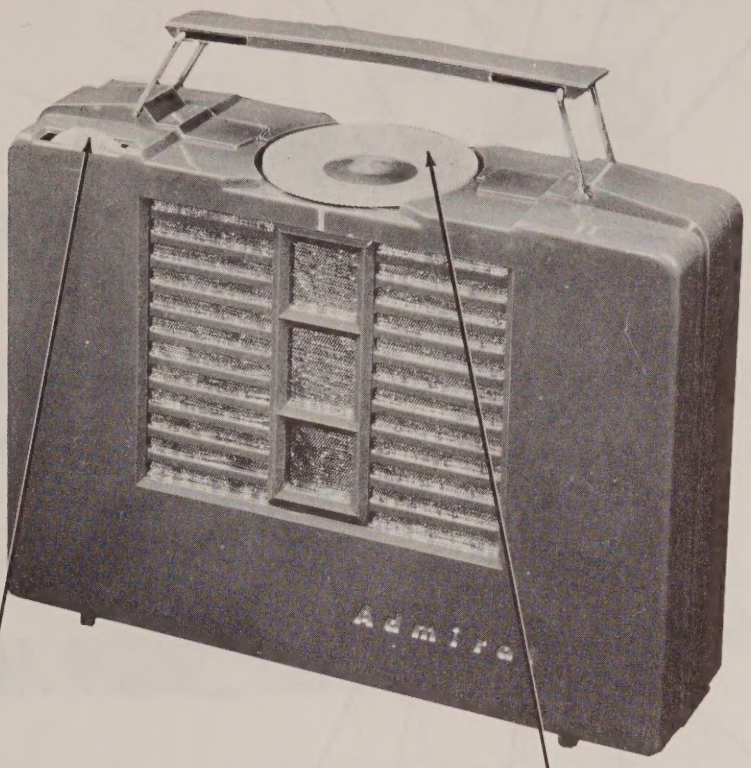

VOLUME CONTROL ON-OFF SWITCH

TUNING

ADMIRAL
CHASSIS 4X1

TRADE NAME	Admiral Models 4X11, 4X12, 4X18, 4X19 (Chassis 4X1)
MANUFACTURER	Admiral Corp., 3800 W. Cortland St., Chicago 47, Ill.
TYPE SET	Battery Operated Portable AM Superheterodyne Receiver
TUBES (Four)	Types 1R5 Conv., 1U4 IF Amp., 1U5 Det-AVC-AF Amp., 3V4 Output
POWER SUPPLY RATINGS	1.5 Volts "A" Supply & 67.5 Volts "B" Supply 240MA@ 1.5 Volts DC & 9MA@ 67.5 Volts DC
TUNING RANGE—BROADCAST	535-1620KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.
New batteries should be installed for accurate alignment.
Use IF alignment tool with a blade 3/32" wide.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1	.1MFD	High side to antenna stator lug on tuning gang. Low side to chassis.	455KC (400Ω Mod)	Tuning gang fully open.	Across voice coil	A1, A2, A3, A4	Adjust for maximum output.
2	"	"	1620KC	"	"	A5	"
3		Loop	1400KC	Tune to 1400KC signal.	"	A6	Fashion loop of several turns of wire and radiate signal into loop of receiver Adjust for maximum output.

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PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA, GENERAL ELECTRIC, WESTINGHOUSE)

ITEM No.	USE	REPLACEMENT DATA		RETMA BASE TYPE	NOTES
		ADMIRAL PART No.	STANDARD REPLACEMENT		
V1	Converter	1R5	1R5	7AT	
V2	IF Amp.	1U4	1U4	6AR	
V3	Det-AVC-AF Amp.	1U5	1U5	6BW	
V4	Output	3V4	3V4	6BX	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	ADMIRAL PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C1	10	75	67A4-11	PRS150/12		BR1015		TC42	TVA-1406	
C2	10000		65A10-3	BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	
C3	100		65C6-3	SI100	D6-103	TP34	GP1K-101	UC-531	5GA-T1	
C4	5000		65A10-5	BPD-005	DD-502	K080	801-005	DC-525	5HK-D5	
C5	5000		65A10-5	BPD-005	DD-502	K080	801-005	DC-525	5HK-D5	
C6	10000		65A10-3	BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	
C7A	150		♦63B6-6	♦PA-136	♦PC-160	TP36	GP1K-151	UC-5315	♦DP-1	
B	2000					TP56	GP2L-202	DC-522		
C	150					TP36	GP1K-151	UC-5315		
D	10000					TP67	GP2-333-103	DC-511		
E	5000					TP64	GP2-333-502	DC-525		
C8	2000		65B9-37	SI2000	D6-202	TP56	GP2L-202	UC-522	5GA-D2	

♦ Items C7A, C7B, C7C, C7D, C7E, R6A, R6B, R6C and R6D are combined in one unit.

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	ADMIRAL PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	
R1	1Meg	½	75B19-1					Volume and Switch

RESISTORS

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	ADMIRAL PART No.	IRC PART No.	
R2	100KΩ	1/2	60B8-104	BTS-100K	
R3	18KΩ	1/2	60B8-183	BTS-18K	
R4	10Meg	1/2	60B8-106	BTS-10Meg	
R5	3.3Meg	1/2	60B8-335	BTS-3.3Meg	

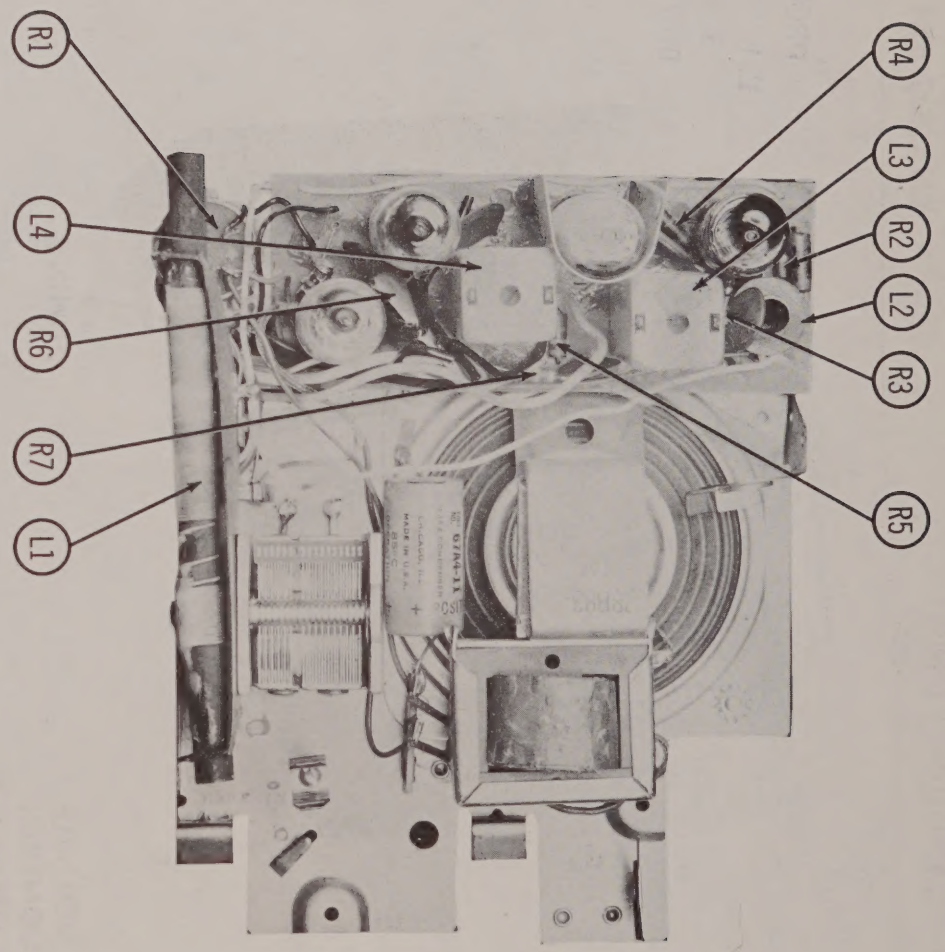
ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	ADMIRAL PART No.	IRC PART No.	
R6A	10Meg	1/2	♦63B6-6	BTS-10Meg	
B	4.7Meg	1/2		BTS-4.7Meg	
C	1Meg	1/2		BTS-1Meg	
D	3.3Meg	1/2		BTS-3.3Meg	
R7	390Ω	1/2	60B8-391	BTS-390	

♦ Items R6A, R6B, R6C, R6D, C7A, C7B, C7C, C7D and C7E are combined in one unit.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	ADMIRAL PART No.	Stancor PART No.	Merit PART No.	Triad PART No.	Halldorson PART No.	Thordarson PART No.	
T1	9.8KΩ	3.8Ω	98A21	A-3879 ①	A-2932 ①	S-51X ①	Z1117 ①	24S60 ①	① Bend mounting tabs down File out slots. Mount on original mounting bracket.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

SPEAKER

ITEM No.	RATINGS			REPLACEMENT DATA			NOTES
	SIZE	FIELD	V. C. IMP.	ADMIRAL PART No.	VIKING PART No.	QUAM PART No.	
SP1	3½"	PM	3.8Ω	Y8B83-1 ①	35J4	3A07	① Includes output transformer.

COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA				NOTES
		PRI.	SEC.	ADMIRAL PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L1	Ant. Coil	.5Ω		69B166-1				
L2	Osc. Coil	1.8Ω	7Ω	69A165-1	14-1074		70-Osc.	
L3	Input IF	19Ω	19Ω	72B28-64	16-6758	BC-352	12-C1	
L4	Output IF	19Ω	19Ω	72B28-64	16-6758	BC-353	12-C2	

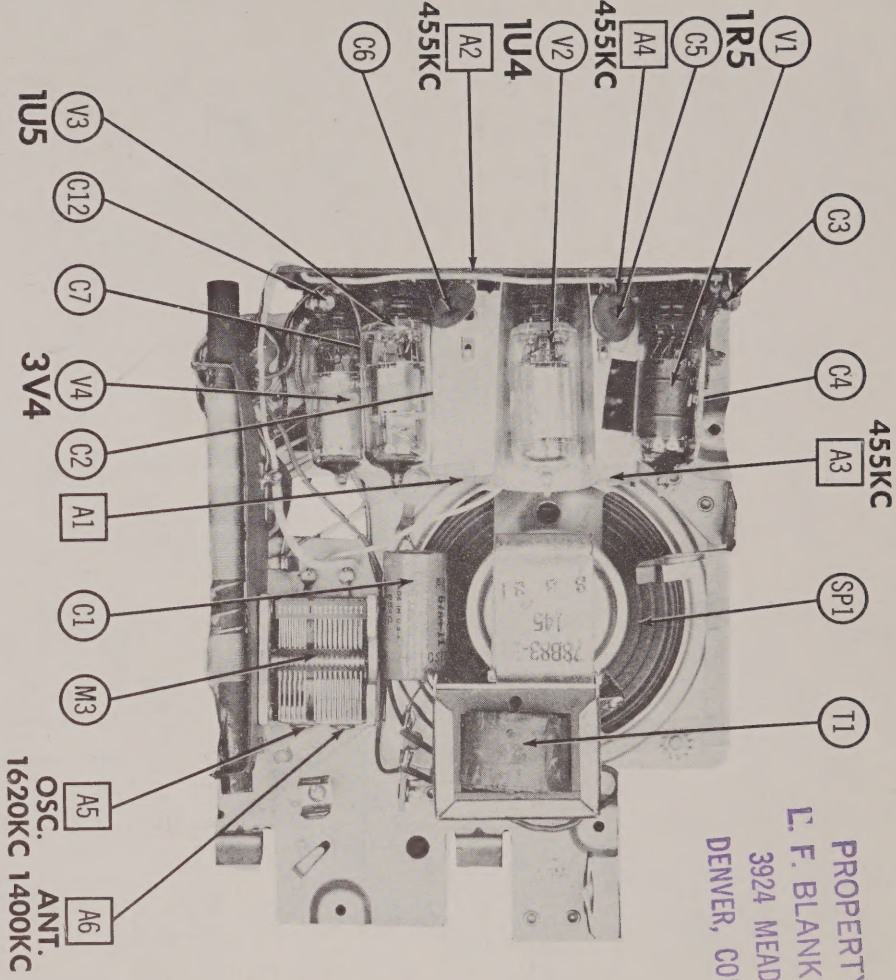
BATTERIES

ITEM No.	VOLTAGE	ADMIRAL PART No.	REPLACEMENT DATA						INSTALLATION NOTES
			EVEREADY			BURGESS			
			"A"	"B"	"A-B"	"A"	"B"	"A-B"	
M1	1.5V		964			21R			Connect 2 in parallel.
M2	67.5V			477			P45		

MISCELLANEOUS

ITEM No.	PART NAME	ADMIRAL PART No.	NOTES
M3	Tuning Cap.	68B56	14-235MMF; 16-112MMF.
	Cabinet	34D64-1	Front (includes grille) ebony - Model 4X11
	Cabinet	34D64-3	Front (includes grille) maroon - Model 4X12
	Cabinet	34D64-5	Front (includes grille) green - Model 4X18
	Cabinet	34D64-7	Front (includes grille) gray - Model 4X19
	Cabinet	34D64-2	Rear - ebony - Model 4X11
	Cabinet	34D64-4	Rear - maroon - Model 4X12
	Cabinet	34D64-6	Rear - green - Model 4X18
	Cabinet	34D64-8	Rear - gray - Model 4X19
	Handle	37B87-1	Ebony - Model 4X11
	Handle	37B87-2	Maroon - Model 4X12
	Handle	37B87-3	Green - Model 4X18
	Handle	37B87-4	Gray - Model 4X19
	Knob	33B104-1	Tuning - ebony - Model 4X11
	Knob	33B104-3	Tuning - maroon - Model 4X12
	Knob	33B104-5	Tuning - green - Model 4X18
	Knob	33B104-7	Tuning - gray - Model 4X19
	Knob	33B104-2	Volume-On-Off - ebony - Model 4X11
	Knob	33B104-4	Volume-On-Off - maroon - Model 4X12
	Knob	33B104-6	Volume-On-Off - green - Model 4X18
	Knob	33B104-8	Volume-On-Off - gray - Model 4X19

CHASSIS — TOP VIEW



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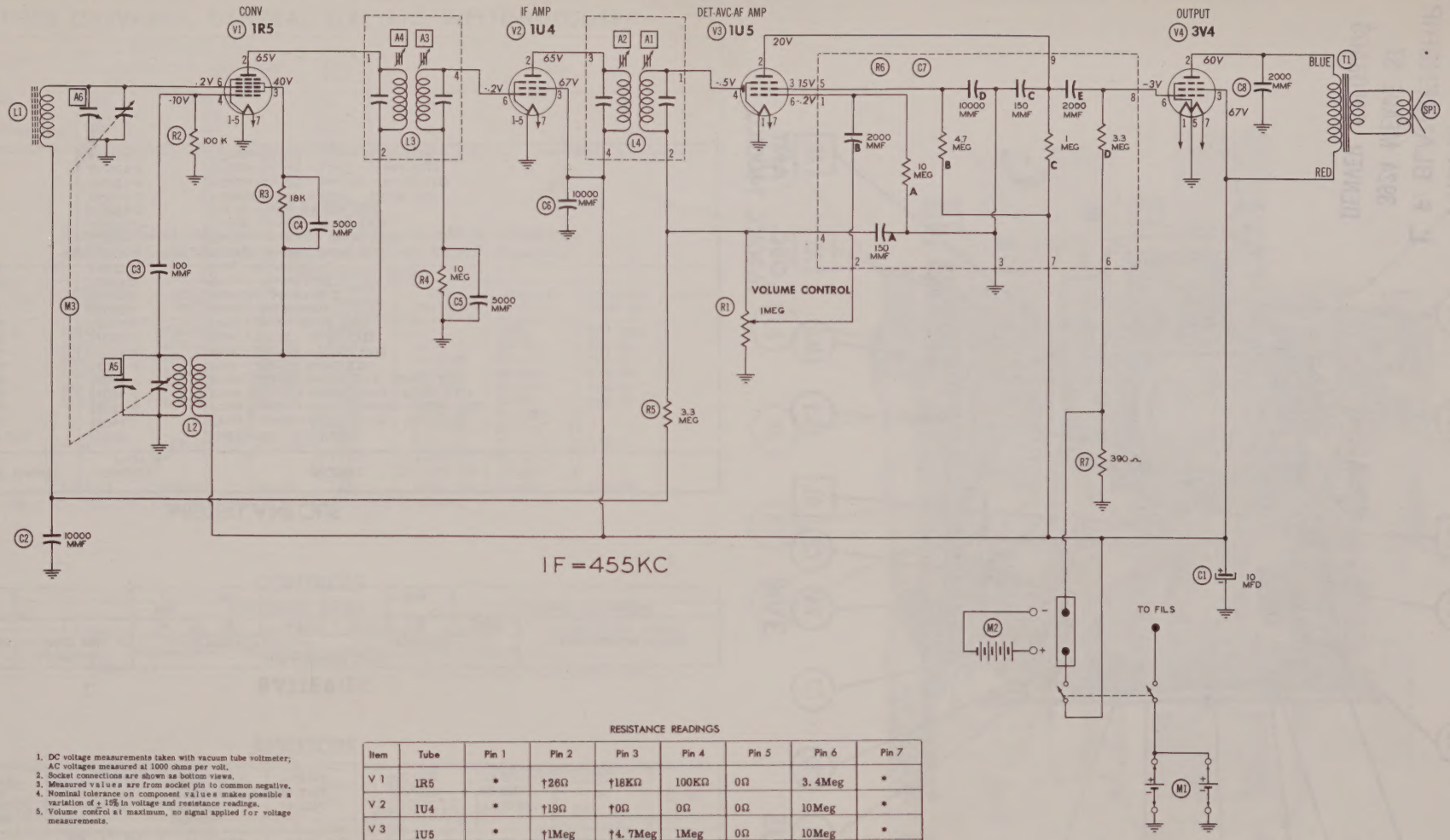
ADMIRAL
MODEL 4X11 (Ch. 4X1)



RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V 1	1R5	*	†26Ω	†18KΩ	100KΩ	0Ω	3. 4Meg	*
V 2	1U4	*	†19Ω	†0Ω	0Ω	0Ω	10Meg	*
V 3	1U5	*	†1Meg	†4. 7Meg	1Meg	0Ω	10Meg	*
V 4	3V4	*	†570Ω	†0Ω	†0Ω	*	3. 3Meg	*

† MEASURED FROM POSITIVE TERMINAL OF "B" BATTERY.
* DO NOT USE OHMMETER TO MEASURE FILAMENT RESISTANCE.

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.
5. Volume control at maximum, no signal applied for voltage measurements.

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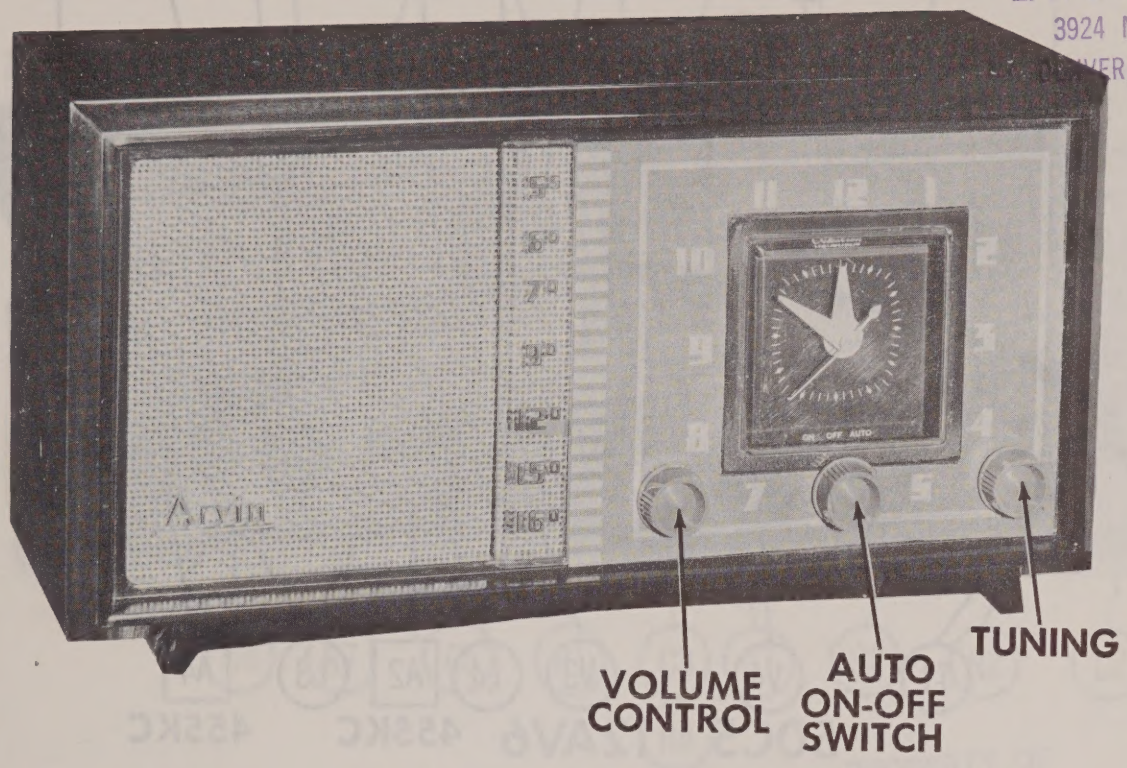
ARVIN MODELS
858T, 859T (Ch. RE374)



ARVIN MODELS
858T, 859T (Ch. RE374)

TRADE NAME	Arvin Models 858T, 859T (Ch. RE374)
MANUFACTURER	Arvin Industries, Columbus, Ind.
TYPE SET	AC Operated AM Superheterodyne Receiver With Electric Clock
TUBES (Five)	Types 12BE6 Conv., 12BA6 IF Amp., 12AV6 Det.-AVC-AF Amp., 50C5 Output, 35W4 Rectifier
POWER SUPPLY	110-120 Volts AC-60 Cycles — RATING .28 Amp. @ 117 Volts AC
TUNING RANGE—BROADCAST	540KC - 1650KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.
Loop should be maintained in same relative position to chassis as when receiver is in cabinet.
To set pointer, turn tuning capacitor fully closed and set pointer parallel with base of dial.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.1MFD	High side to pin 7 (grid) of 12BE6 (V1). Low side to chassis.	455KC (400~Mod)	Tuning gang fully open	Across voice coil	A1, A2, A3, A4	Adjust for maximum output. If isolation transformer is not used, reduce dummy antenna to .001MFD to reduce hum modulation.
2.	"	"	1650KC	"	"	A5	"
3.		Loop	1400KC	Tune to 1400KC signal	"	A6	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
4.		"	600KC	Tune to 600KC signal	"		Bend antenna rotor plates for maximum output. Repeat step 3.

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PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA, GENERAL ELECTRIC, WESTINGHOUSE)

ITEM No.	USE	REPLACEMENT DATA: ARVIN PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RETMA BASE TYPE	NOTES
V1	Converter	12BE6	12BE6	7CH	
V2	IF Amplifier	12BA6	12BA6	7BK	
V3	Det.-AVC-AF Amp.	12AV6	12AV6	7BT	
V4	Output	50C5	50C5	7CV	
V5	Rectifier	35W4	35W4	5BQ	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: ARVIN PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C1A	50	150	41972	PRS150/50-30		BBRD5315		TCD-497	TVA-2450	Red
B	30	150								Blue
C2	.047	200	20067-503	P288-047	DF-503	PJ2S47		PT4147	2TM-S47	
C3A	220									
B	2000									
C	5000		♦41696	♦PA-113-1	♦PC-150	♦116TM 1	♦1408-01		♦DT-1	
D	250									
E										
C4	.1	400	20067-104	P488-1	DF-104	CUB4P1		PT401	4TM-P1	
C5	10000		22295	BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	
C6	.05	400	20068-503	489ZX-05	DF-503	CUB4S5		PT415	4TM-S5	
C7	.05	400	20068-503	489ZX-05	DF-503	CUB4S5		PT415	4TM-S5	

♦ Items C3A, C3B, C3C, C3D, C3E, R4A, R4B and R4C are combined in one unit. When replacing items separately C3D and C3E should total 250MMF.

CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: ARVIN PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	500KΩ	½	A41817		A47-500K-Z	AB-60		Volume
B	Shaft		Not Req.		RS-2	AK-8		Attach to R1A

RESISTORS

ITEM No.	RATING: OHMS	RATING: WATT	REPLACEMENT DATA: ARVIN PART No.	REPLACEMENT DATA: IRC PART No.	NOTES
R2	22KΩ	½	20061-223	BTS-22K	
R3	2.2Meg	½	20061-225	BTS-2.2Meg	
R4A	6.8Meg	½		BTS-6.8Meg	
B	470KΩ	½	♦41696	BTS-470K	
C	470KΩ	½		BTS-470K	

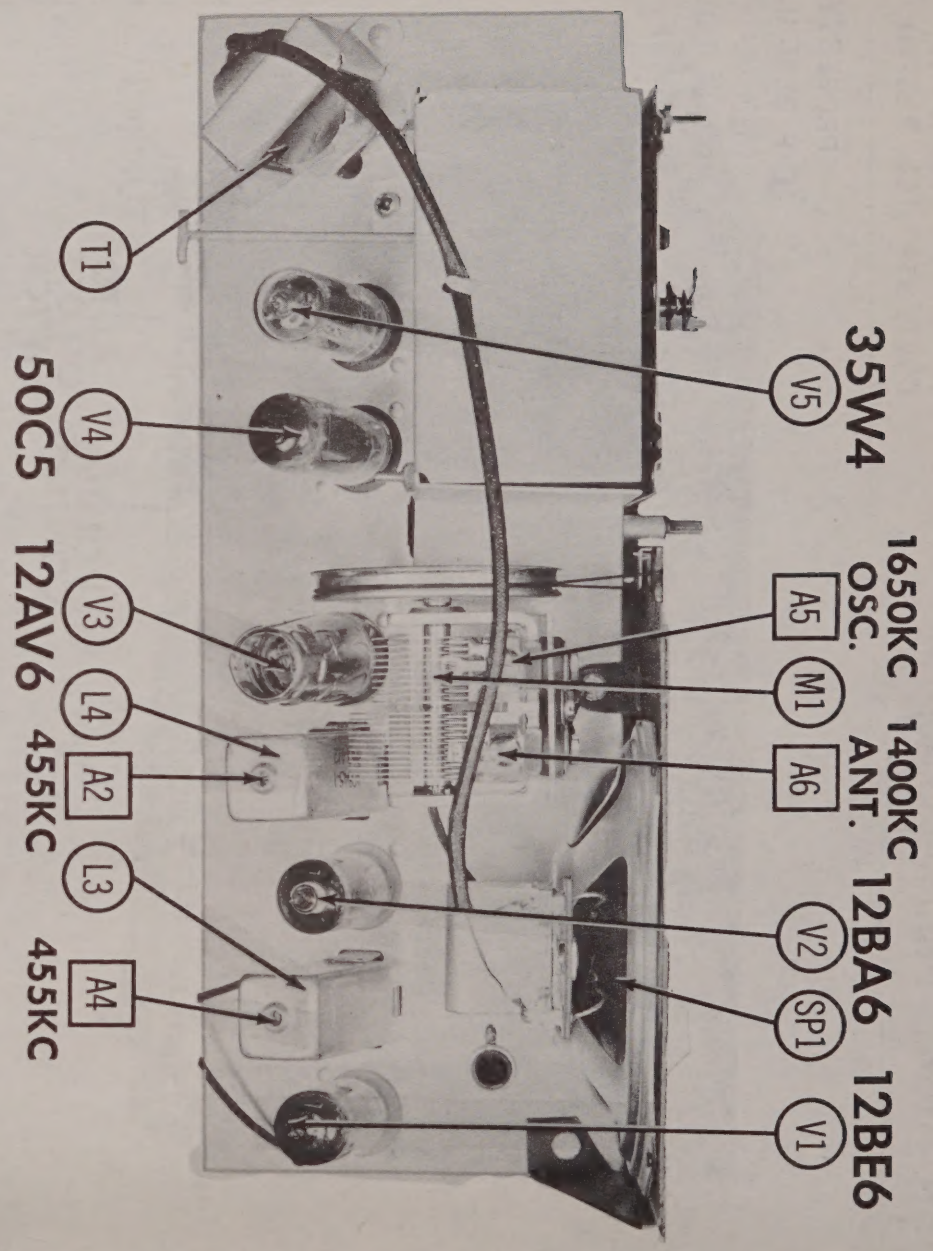
ITEM No.	RATING: OHMS	RATING: WATT	REPLACEMENT DATA: ARVIN PART No.	REPLACEMENT DATA: IRC PART No.	NOTES
R5	120Ω	½	22381-121	BTS-120	
R6	100KΩ	½	20061-104	BTS-100K	
R7	1200Ω	1	20070-122	BTA-1200	
R8	330KΩ	½	20061-334	BTS-330K	

♦ Items R4A, R4B, R4C, C3A, C3B, C3C, C3D, C3E are combined in one unit.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE: PRI.	IMPEDANCE: SEC.	REPLACEMENT DATA: ARVIN PART No.	Stancor PART No.	Merit PART No.	Triad PART No.	Halldorson PART No.	Thordarson PART No.	NOTES
T1	2.4KΩ	3.1Ω	42028-1	A-3332	A-3025	S-12X	Z1101	24S50 ①	① Drill one new mounting hole.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

SPEAKER

ITEM No.	RATINGS			REPLACEMENT DATA			NOTES
	SIZE	FIELD	V. C. IMP.	ARVIN PART No.	JENSEN PART No.	QUAM PART No.	
SP1	4"	PM	3.1Ω	22875	ST-113 Mod. P4-X	4A07	

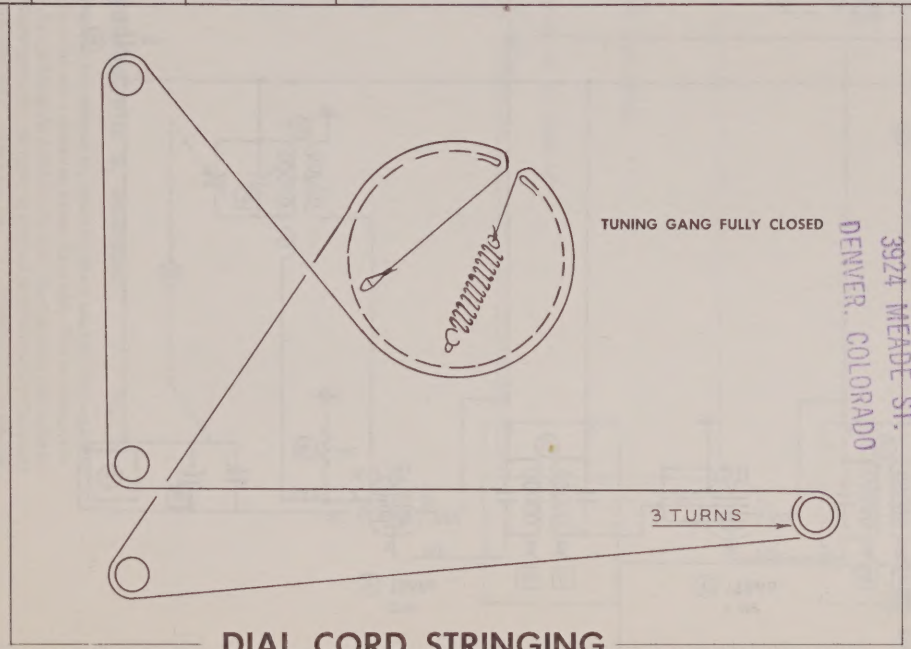
COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA				NOTES
		PRI.	SEC.	ARVIN PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L1	Loop Ant.	3.3Ω		42036-1				Includes cabinet back
L2	Osc. Coil	.5Ω	7Ω	41980-1	14-1073 *		69-Osc.*	Tertiary winding
L3	Input IF	12Ω	12Ω	40845-1	16-6758	BC-352	12-C1	
L4	Output IF	13Ω	13Ω	40845-1	16-6758	BC-353	12-C2	

* Drill new mounting hole.

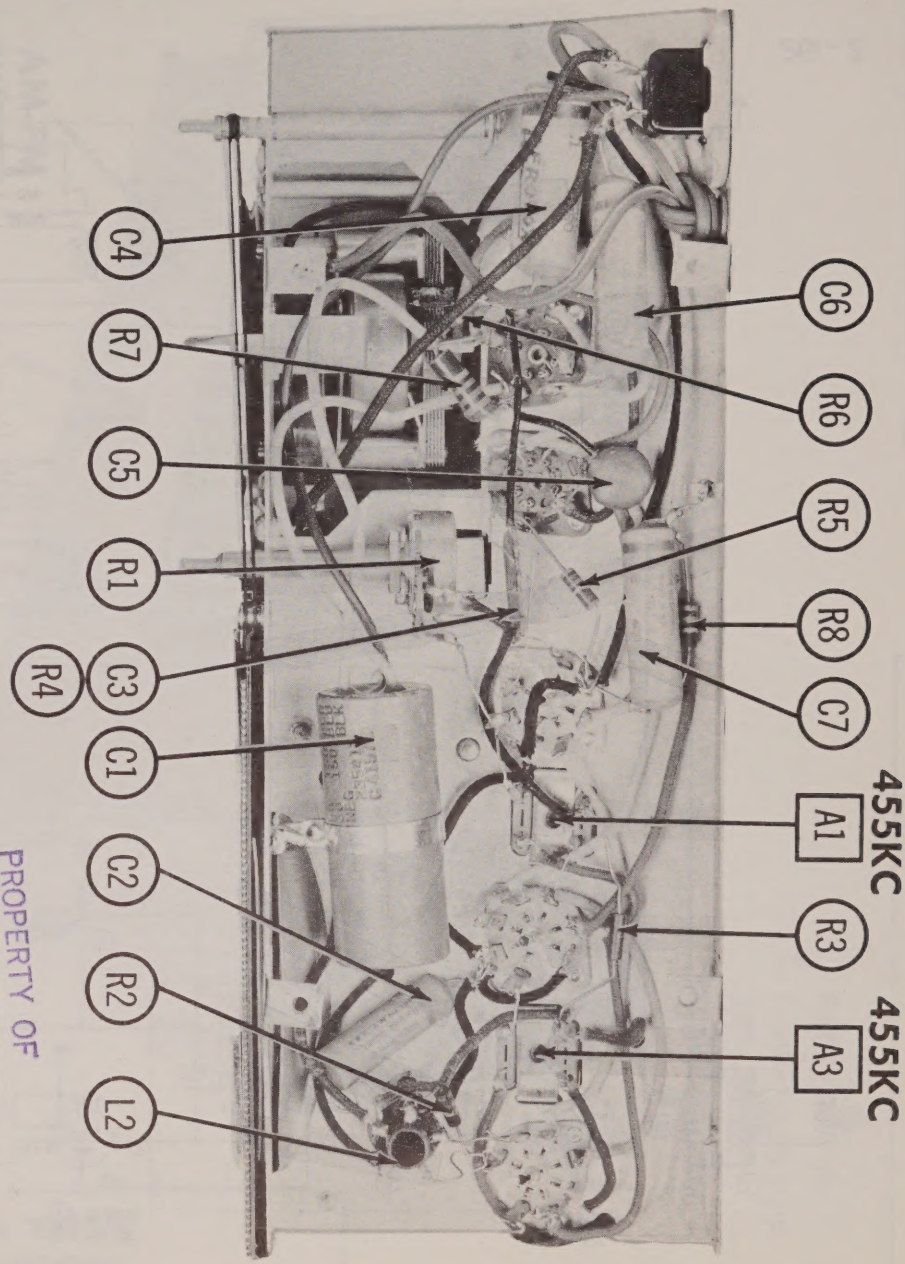
MISCELLANEOUS

ITEM No.	PART NAME	ARVIN PART No.	NOTES
M1	Tuning Cap.	41813	11-305MMF, 15-130MMF
	Cabinet	42002-1	Ivory - Includes radio & clock crystal
	Cabinet	42002-2	Willow green - Includes radio & clock crystal
	Cabinet	42002-3	Sandalwood - Includes radio & clock crystal
	Cabinet	42002-4	Rosewood - Includes radio & clock crystal
	Knob	41811-1	Clock
	Knob	41811-2	Volume & tuning
	Pointer	41812	
	Clock Timer	41810-1	



DIAL CORD STRINGING

CHASSIS—BOTTOM VIEW



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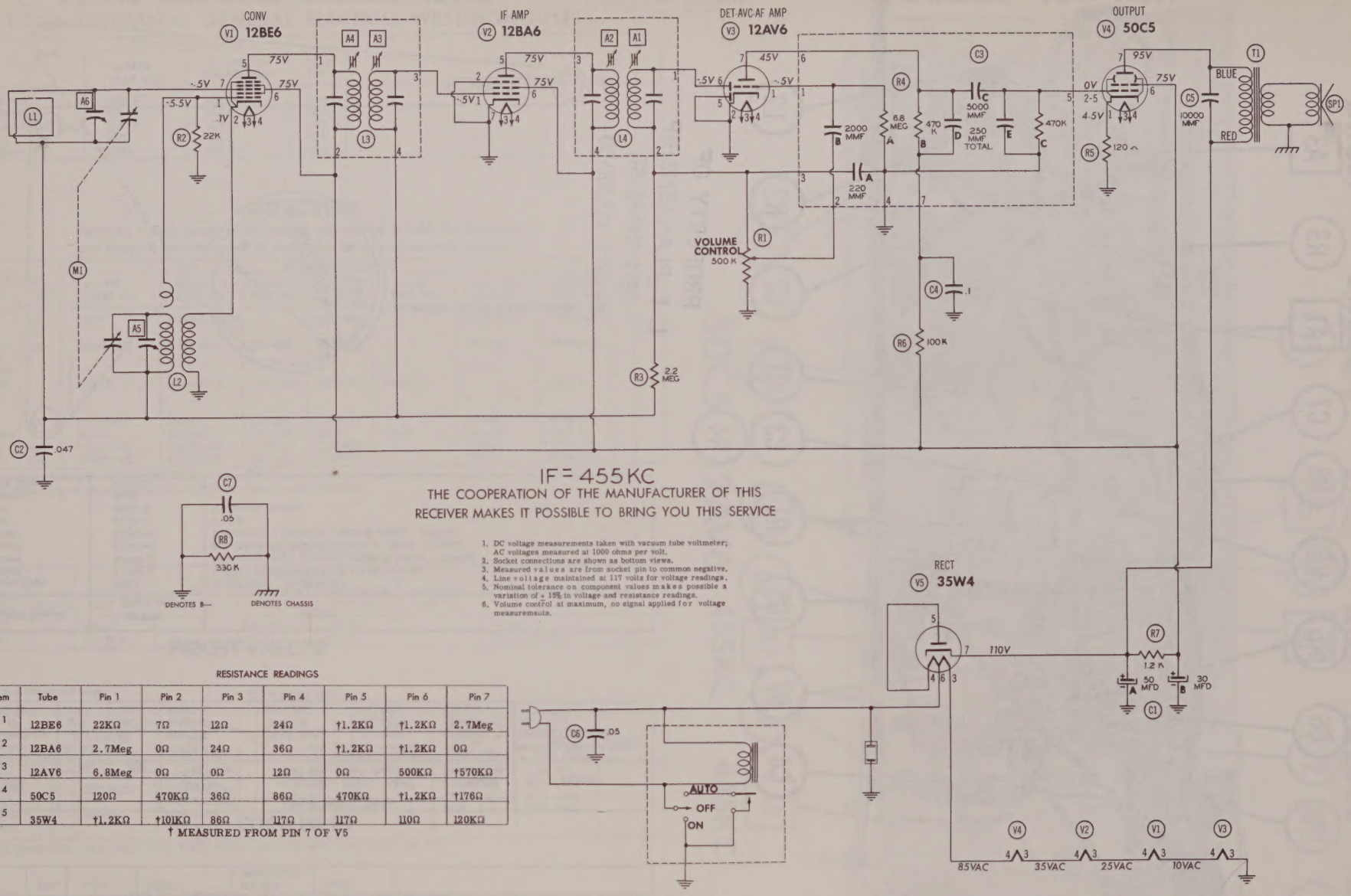

IF = 455 KC

THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V 1	12BE6	22KΩ	7Ω	12Ω	24Ω	†1.2KΩ	†1.2KΩ	2.7Meg
V 2	12BA6	2.7Meg	0Ω	24Ω	36Ω	†1.2KΩ	†1.2KΩ	0Ω
V 3	12AV6	6.8Meg	0Ω	0Ω	12Ω	0Ω	500KΩ	†570KΩ
V 4	50C5	120Ω	470KΩ	36Ω	86Ω	470KΩ	†1.2KΩ	†176Ω
V 5	35W4	†1.2KΩ	†10KΩ	86Ω	117Ω	117Ω	110Ω	120KΩ

† MEASURED FROM PIN 7 OF V5

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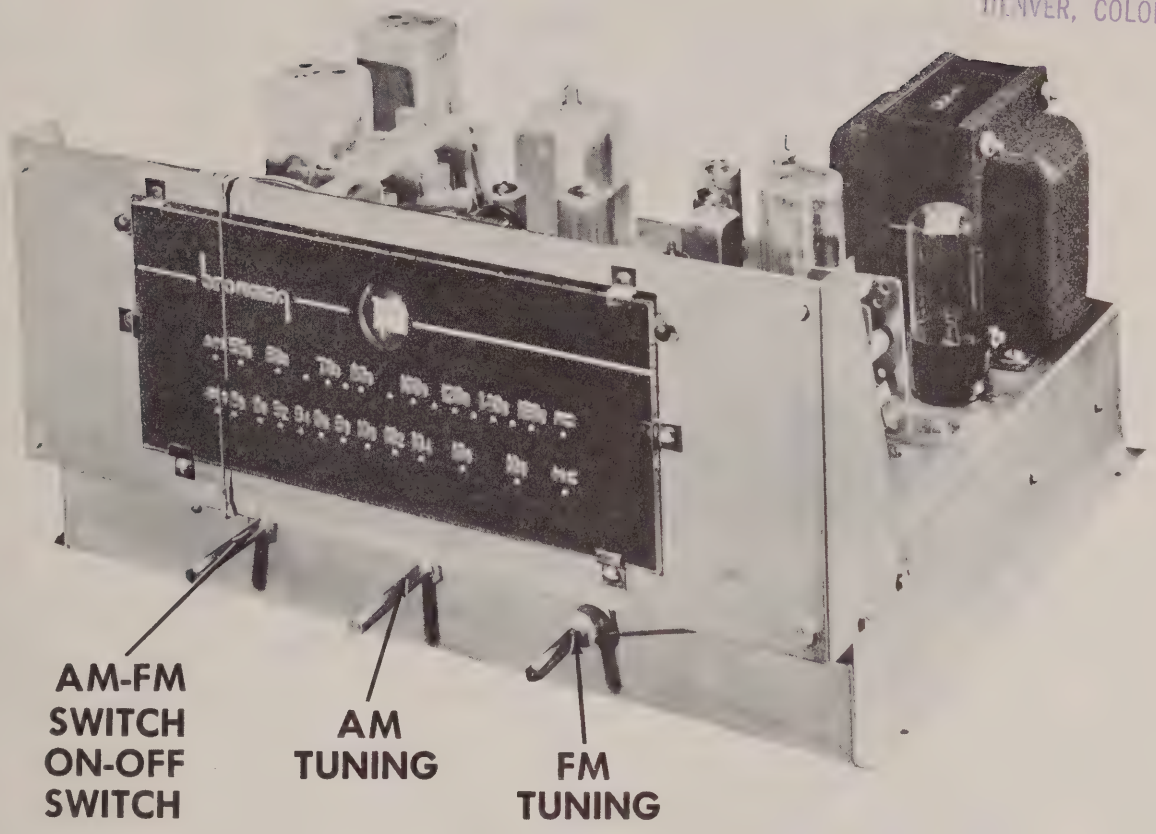
3924 MEADE ST.
DENVER, COLORADO

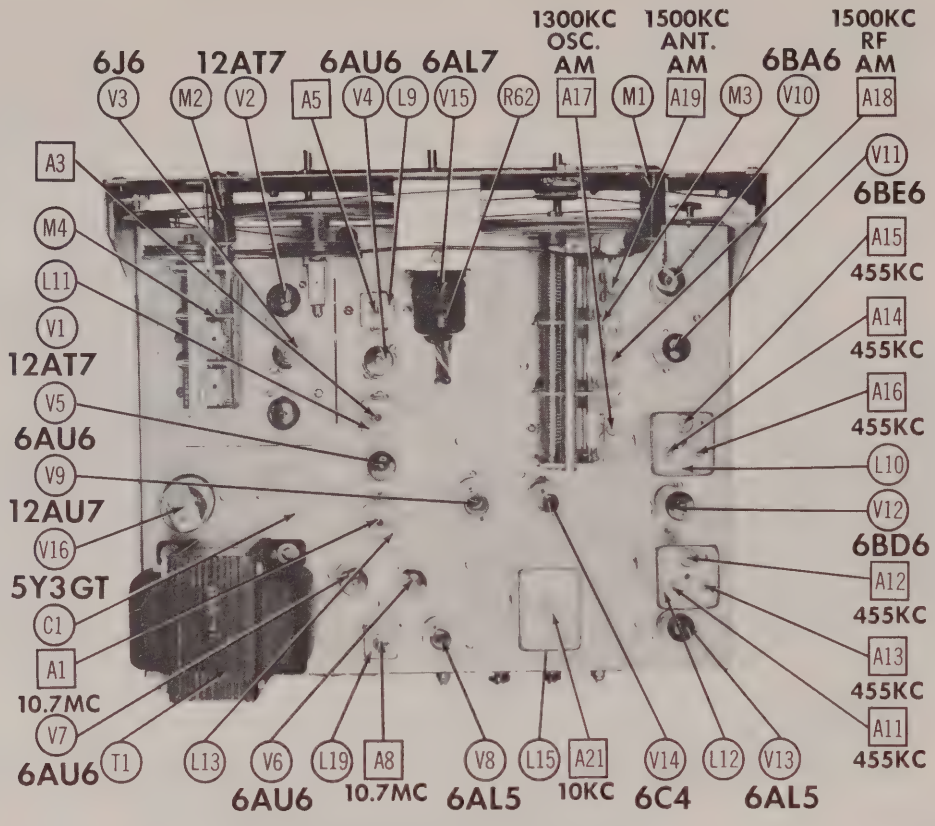
BROWNING
MODEL RJ-48



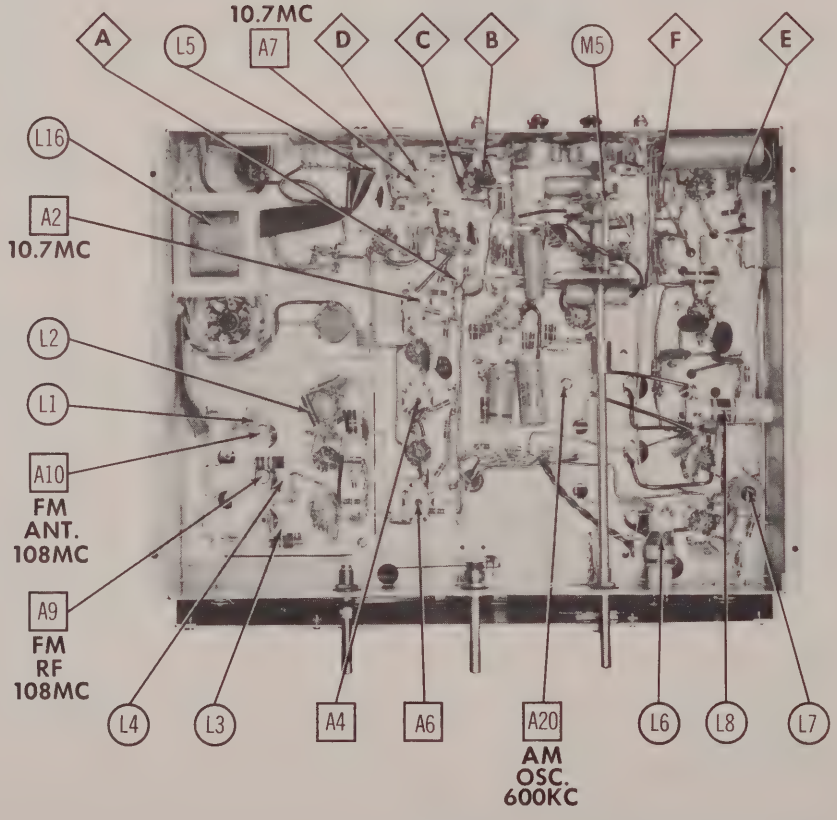
BROWNING
MODEL RJ-48

TRADE NAME	Browning Model R J-48	
MANUFACTURER	Browning Laboratories, Inc, Winchester, Mass.	
TYPE SET	AC Operated AM-FM Superheterodyne Tuner for Custom Installation	
TUBES	Sixteen	
POWER SUPPLY	110-120 Volts AC-50/60 Cycles	RATING .79 Amp. @ 117 Volts AC
TUNING RANGE	-BROADCAST 500-1700KC	FREQ. MOD. 88-108MC

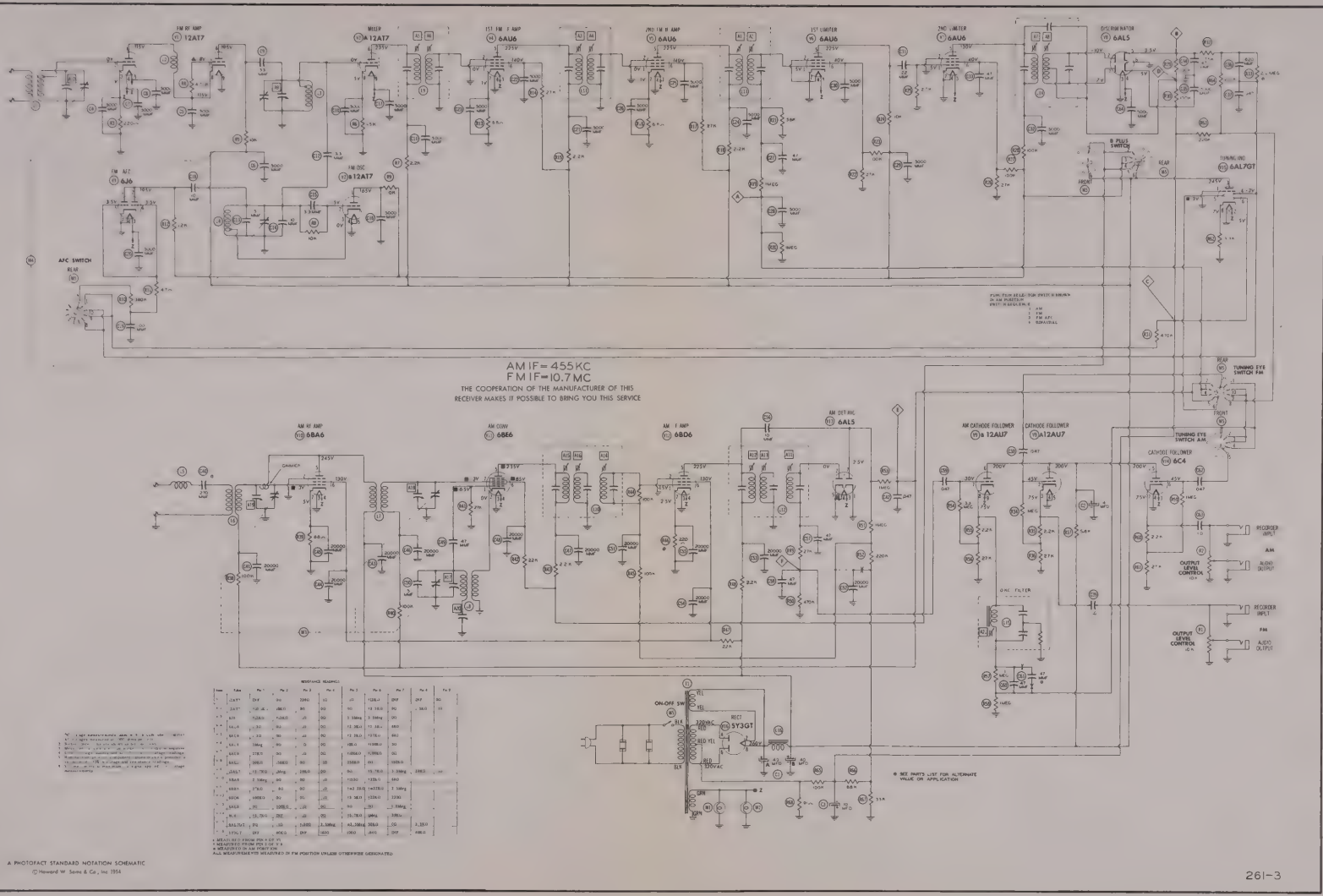
"The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed." "Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. Copyright 1954 by Howard W. Sams & Co., Inc., Indianapolis 5, Indiana, U. S. of America. Copyright under International Copyright Union. All rights reserved under Inter-American Copyright Union (1910) by Howard W. Sams & Co., Inc." Printed in U. S. of America



CHASSIS TOP VIEW



CHASSIS BOTTOM VIEW-ALIGNMENT IDENTIFICATION


AM IF = 455 KC
FM IF = 10.7 MC
THE COOPERATION OF THE MANUFACTURER OF THIS
RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE
AFC SWITCH
REAR
FRONT
TUNING EYE SWITCH FM
TUNING EYE SWITCH A.M.
ON-OFF SW
RECT
5Y3GT
RECORDER INPUT
AM
AUDIO OUTPUT
OUTPUT LEVEL CONTROL
FM
AM CATHODE FOLLOWER
CATHODE FOLLOWER
AM DET-AVC
AM CONV
AM RF AMP
AM IF AMP
FM DET-AVC
FM CONV
FM RF AMP
FM IF AMP
MIXER
1ST FM IF AMP
2ND FM IF AMP
1ST LIMITER
2ND LIMITER
DISCRIMINATOR
TUNING IND
B PLUS SWITCH
AFC FILTER
A PHOTOFACT STANDARD NOTATION SCHEMATIC
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261-3

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ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

With AM and FM tuning gang capacitors fully closed, set AM and FM dial pointers to last reference marks at low frequency ends of dial scales.

FM IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
1	.1MFD	High side to pin 7 (grid) of 12AT7 (V2A). Low side to chassis.	10.7MC (Unmod.)	FM	Point of non-interference.	DC probe to point (A). Common to chassis.	A1, A2, A3, A4, A5, A6	Attenuate generator output to maintain approximately 5 volts at VTVM. Adjust for maximum deflection. Adjust signal generator in steps of 25KC above and below 10.7MC. Deflection at VTVM should remain nearly constant up to 75KC above and below 10.7MC. If necessary, retouch A1 thru A6 until this condition is obtained.
2	"	"	10.7MC	"	"	DC probe to point (B). Common to point C.	A8	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.
3	"	"	"	"	"	DC probe to point (D). Common to point C.	A7	Adjust for maximum deflection. Adjust generator 100KC above and below 10.7MC. Deflection at VTVM should be equal and of opposite polarity. Repeat steps 2 and 3 until this condition is obtained.

FM IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60~ modulation and 450KC sweep. Use 120~ sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT SCOPE	ADJUST	REMARKS
1.	.01MFD	High side to pin 7 (grid) of 12AT7 (V2A) Low side to chassis.	10.7MC (450KC Swp)	FM	Point of non-interference	Vert. Amp. to point (A). Low side to chassis.	A1, A2, A3, A4, A5, A6	Adjust for response curve of maximum amplitude and symmetry similar to Fig. 1. Use only enough sweep generator output to provide usable indication on scope.
2.	"	"	"	"	"	Vert. Amp. to point (B). Low side to chassis.	A7, A8	Adjust A8 so that 10.7MC occurs at center of crossover lines as in Fig. 2. Adjust A7 for maximum amplitude and straightness of crossover lines. Continue alignment with step 4.

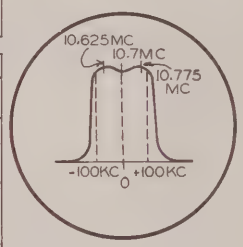


FIG. 1

FM RF ALIGNMENT

Set VTVM to 5 Volt scale.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
4	Two 120Ω carbon resistors.	Across FM antenna terminals with 120Ω in each lead.	108MC (Unmod.)	FM	108MC	DC probe to point (A). Common to chassis.	L4	Adjust for maximum deflection by compressing or expanding coil turns of L4.
5	"	"	88MC	"	88MC	"		Adjust for maximum deflection by bending FM oscillator rotor plates on FM tuning gang (section nearest panel).
6	"	"	108MC	"	108MC	"	A5	Adjust for maximum deflection. Repeat steps 4 and 6 until maximum deflection is obtained at 108MC.
7	"	"	88MC	"	88MC	"		Insert both ends of tuning wand in L3. If brass end of wand increases deflection on VTVM, slightly spread FM oscillator plates. If iron end of wand increases deflection on VTVM, slightly compress the FM oscillator plates. Continue this procedure in small steps until maximum deflection is obtained.
8	"	"	108MC	"	Tune to 108MC signal.	"	A10	Adjust for maximum deflection.

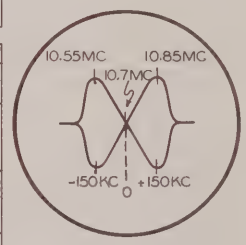
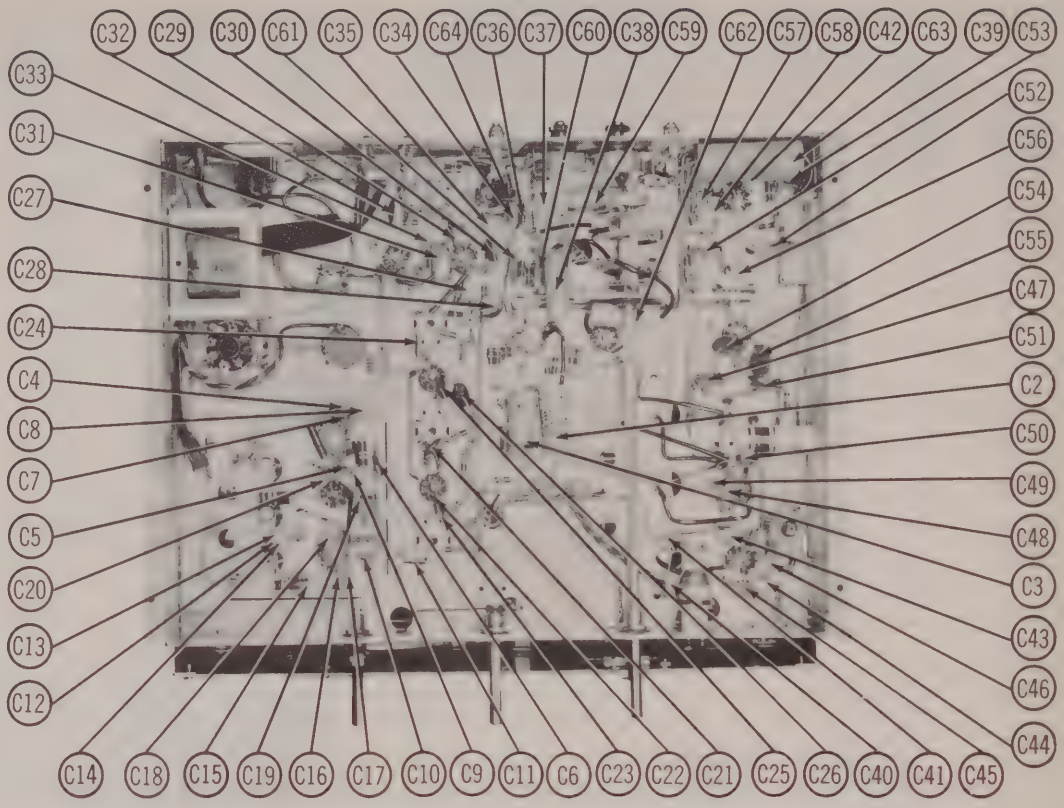


FIG. 2

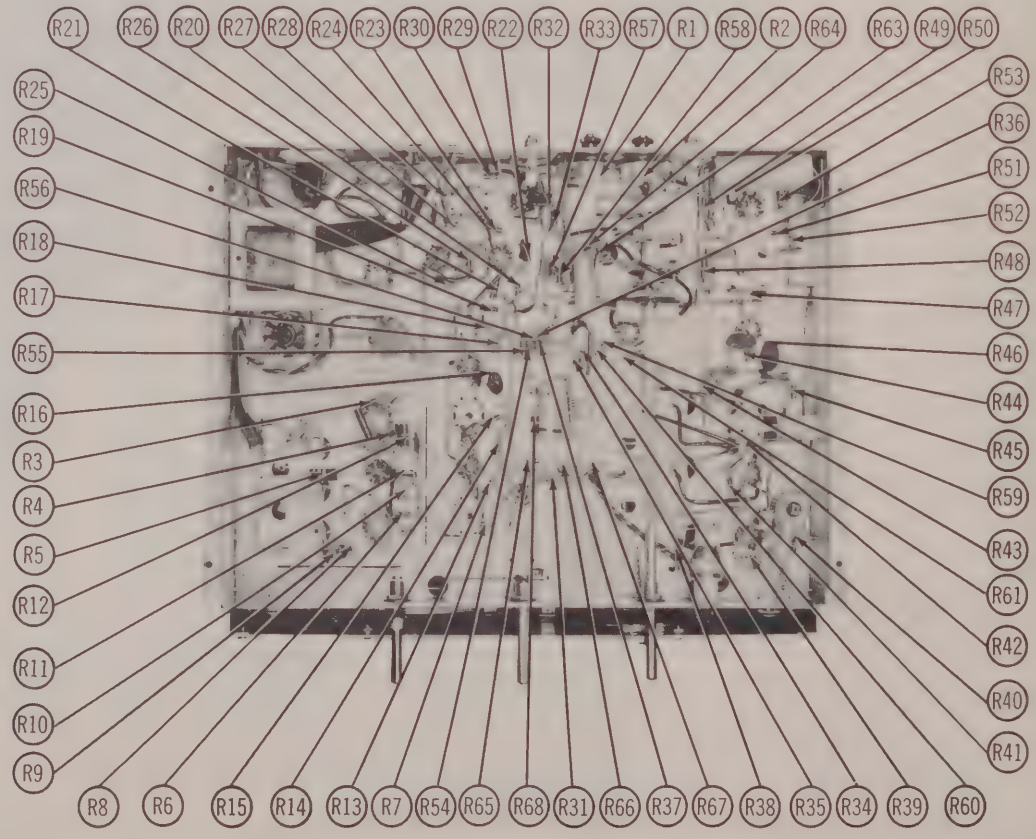
AM ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
9.	.01MFD	High side to pin 7 (grid) of 6BE6 (V11). Low side to chassis.	455KC (Unmod)	AM	Tuning gang fully open	DC probe to point (B). Common to chassis.	A11, A12, A13, A14, A15, A16	Adjust for maximum deflection. Vary signal generator from 453KC to 457KC and note VTVM deflection. The deflection should be approximately the same if response is symmetrical. If necessary, retouch A11 thru A16 until this condition is obtained.
10.	Direct	High side to ungrounded AM antenna terminal. Low side to chassis.	1300KC (Unmod)	"	1300KC	"	A17	Adjust for maximum deflection.
11.	"	"	1500KC	"	Tune to 1500KC signal	"	A18, A19	"
12.	"	"	600KC	"	600KC	"	A20	Adjust for maximum deflection. Repeat steps 10 and 11.
13.	Connect AM antenna to tuner and tune in a station between 1500 and 1600KC and adjust A19 for maximum deflection.							
14.	.01MFD	High side to point (F). Low side to chassis.	10KC	AM	Tuning gang fully open	Use OUTPUT METER Across AM audio output jack (rear panel)	A21	Adjust for MINIMUM output.



CHASSIS BOTTOM VIEW-CAPACITOR IDENTIFICATION



CHASSIS BOTTOM VIEW-RESISTOR IDENTIFICATION

PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA, GENERAL ELECTRIC, WESTINGHOUSE)

ITEM No.	USE	REPLACEMENT DATA: BROWNING PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RETMA BASE TYPE	NOTES
V1	FM RF Amp.	12AT7	12AT7	9A	
V2	FM Mixer & Osc.	12AT7	12AT7	9A	
V3	FM AFC	6J6	6J6	7BF	
V4	1st. FM IF Amp.	6AU6	6AU6	7BK	
V5	2nd. FM IF Amp.	6AU6	6AU6	7BK	
V6	1st. Limiter	6AU6	6AU6	7BK	
V7	2nd. Limiter	6AU6	6AU6	7BK	
V8	Discriminator	6AL5	6AL5	6BT	
V9	Cathode Follower-AM Cathode Follow.	12AU7	12AU7	9A	
V10	AM RF Amp.	6BA6	6BA6	7BK	
V11	AM Converter	6BE6	6BE6	7CH	
V12	AM IF Amp.	6BD6	6BD6	7CK	
V13	AM Det.-AVC	6AL5	6AL5	6BT	
V14	Cathode Follower	6C4	6C4	6BG	
V15	Tuning Indicator	6AL7GT	6AL7GT	8CH	
V16	Rectifier	5Y3GT	5Y3GT	5T	

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CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: BROWNING PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C1A	▲40	450		AFH2-57		B045		FP238	TVL-2764	
B	■40	450								
C2	4	450		PRS450/4		BR445		TC70	TVA-1702	
C3	10	25		PRS25/10		BR102		TC22	TVA-1204	
C4	5000			BPD-005	DD-502	K080	801-005	DC-525	5HK-D5	
C5	5000			BPD-005	DD-502	K080	801-005	DC-525	5HK-D5	
C6	5000			BPD-005	DD-502	K080	801-005	DC-525	5HK-D5	
C7	5000			BPD-005	DD-502	K080	801-005	DC-525	5HK-D5	
C8	5000			BPD-005	DD-502	K080	801-005	DC-525	5HK-D5	
C9	33	500				22R5Q33			MS-43	
C10	5000			BPD-005	DD-502	K080	801-005	DC-525	5HK-D5	
C11	5000			BPD-005	DD-502	K080	801-005	DC-525	5HK-D5	
C12	3.3			SI3.3NP0	TCZ-3.3	TZ06	NP0K-3R3	ZT-5533	5TCCB-V33	
C13	5			SI5N750	TCN-5	TZ07	N750K-050	NT-555	5TCUB-V5	
C14	10									
C15	3.3	500								
C16	5000			BPD-005	DD-502	K080	801-005	DC-525	5HK-D5	
C17	5000			BPD-005	DD-502	K080	801-005	DC-525	5HK-D5	
C18	10	500		1469-00001		22R5Q1		MCE220	MS-41	
C19	100	500		1469-0001		22R5T1		MCE235	MS-31	
C20	5000			BPD-005	DD-502	K080	801-005	DC-525	5HK-D5	
C21	5000			BPD-005	DD-502	K080	801-005	DC-525	5HK-D5	
C22	5000			BPD-005	DD-502	K080	801-005	DC-525	5HK-D5	
C23	5000			BPD-005	DD-502	K080	801-005	DC-525	5HK-D5	
C24	5000			BPD-005	DD-502	K080	801-005	DC-525	5HK-D5	
C25	5000			BPD-005	DD-502	K080	801-005	DC-525	5HK-D5	
C26	5000			BPD-005	DD-502	K080	801-005	DC-525	5HK-D5	
C27	47	500		1469-00005		22R5Q47		MCE225	MS-45	
C28	5000			BPD-005	DD-502	K080	801-005	DC-525	5HK-D5	
C29	5000			BPD-005	DD-502	K080	801-005	DC-525	5HK-D5	
C30	5000			BPD-005	DD-502	K080	801-005	DC-525	5HK-D5	
C31	22	500		1469-00025		22R5Q22		MCE220	MS-42	
C32	5000			BPD-005	DD-502	K080	801-005	DC-525	5HK-D5	
C33	47	500		1469-00005		22R5Q47		MCE225	MS-45	
C34	47			1469-00005		22R5Q47		MCE225	MS-45	
C35	5000			BPD-005	DD-502	K080	801-005	DC-525	5HK-D5	
C36	620	500				IR5T62				
C37	.047	600		P688-047	DF-503	CUB6S47		PT6147	6TM-S47	
C38	.047	600		P688-047	DF-503	CUB6S47		PT6147	6TM-S47	
C39	1.0	200		P484-1.0		PJ2W1		PT41	2TM-M1	
C40	270	500		1469-00025	D6-271	5R5T27	GP2K-271	MCE240	MS-33	Note 1
C41	20000			BPD-02	DD-203	K084		DC-512	5HK-S2	
C42	.047	600		P688-047	DF-503	CUB6S47		PT6147	6TM-S47	
C43	20000			BPD-02	DD-203	K084		DC-512	5HK-S2	
C44	20000			BPD-02	DD-203	K084		DC-512	5HK-S2	

PARTS LIST & DESCRIPTION (continued)

CAPACITORS (cont)

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: BROWNING PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C45	20000			BPD-02	DD-203	K084		DC-512	5HK-S2	
C46	20000			BPD-02	DD-203	K084		DC-512	5HK-S2	
C47	20000			BPD-02	DD-203	K084		DC-512	5HK-S2	
C48	20000			BPD-02	DD-203	K084		DC-512	5HK-S2	
C49	47	500		1469-00005	D6-470	22R5Q47	GP1K-470	MCE225	MS-45	
C50	5	500		1469-00005		22R5V5		MCE205	MS-55	
C51	20000			BPD-02	DD-203	K084		DC-512	5HK-S2	
C52	20000			BPD-02	DD-203	K084		DC-512	5HK-S2	
C53	20000			BPD-02	DD-203	K084		DC-512	5HK-S2	
C54	20000			BPD-02	DD-203	K084		DC-512	5HK-S2	
C55	20000			BPD-02	DD-203	K084		DC-512	5HK-S2	
C56	10	500		1469-00001		22R5Q1		MCE215	MS-41	
C57	47	500		1469-00005		22R5Q47		MCE225	MS-45	
C58	47	500		1469-00005		22R5Q47		MCE225	MS-45	
C59	.047	600		P688-047	DF-503	CUB6S47		PT46147	6TM-S47	
C60	47	500		1469-00005		22R5Q47		MCE225	MS-45	
C61	47	500		1469-00005		22R5Q47		MCE225	MS-45	Note 2
C62	.047	600		P688-047	DF-503	CUB6S47		PT6147	6TM-S47	
C63	1.0	200		P484-1.0		PJ2W1		PT41	2TM-M1	
C64	5000			BPD-005	DD-502	K080	811-005	DC-525	5HK-D5	

Note 1. Some models may use a 220MMF in this application.
Note 2. Not used in all versions.

CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: BROWNING PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	10KΩ	½	SX1931	Q11-116	A47-10K-S	AB-14	SU-20	FM Output Level
B	Shaft		Not Req.	SQ	FKS-1/4	AK-1	Not Req.	Attach to R1A
R2A	10KΩ	½	SX1931	Q11-116	A47-10K-S	AB-14	SU-20	AM Output Level
B	Shaft		Not Req.	SQ	FKS-1/4	AK-1	Not Req.	Attach to R2A

RESISTORS

ITEM No.	RATING: OHMS	RATING: WATT	REPLACEMENT DATA: BROWNING PART No.	IRC PART No.	NOTES
R3	220Ω	½		BTS-220	
R4	470KΩ	½		BTS-470K	
R5	10KΩ	1		BTA-10K	
R6	1500Ω	½		BTS-1500	
R7	2200Ω	½		BTS-2200	
R8	10KΩ	½		BTS-10K	
R9	10KΩ	½		BTS-10K	
R10	390KΩ	½		BTS-390K	
R11	47Ω	½		BTS-47	
R12	12KΩ	2		BTB-12K	
R13	68Ω	½		BTS-68	
R14	27KΩ	½		BTS-27K	
R15	2200Ω	½		BTS-2200	
R16	68Ω	½		BTS-68	
R17	27KΩ	½		BTS-27K	
R18	2200Ω	½		BTS-2200	
R19	1Meg	½		BTS-1Meg	
R20	1Meg	½		BTS-1Meg	
R21	56KΩ	½		BTS-56K	
R22	27KΩ	½		BTS-27K	
R23	100KΩ	½		BTS-100K	
R24	10KΩ	½		BTS-10K	
R25	27KΩ	½		BTS-27K	
R26	27KΩ	½		BTS-27K	
R27	100KΩ	½		BTS-100K	
R28	100KΩ	½		BTS-100K	
R29	100KΩ	½		BTS-100K	
R30	100KΩ	½		BTS-100K	
R31	470KΩ	½		BTS-470K	
R32	75KΩ	½		BTS-75K	
R33	2.2Meg	½		BTS-2.2Meg	Note 1
R34	1Meg	½		BTS-1Meg	
R35	2200Ω	½		BTS-2200	

ITEM No.	RATING: OHMS	RATING: WATT	REPLACEMENT DATA: BROWNING PART No.	IRC PART No.	NOTES
R36	27KΩ	½		BTS-27K	
R37	5600Ω	1		BTA-5600	
R38	100KΩ	½		BTS-100K	
R39	68Ω	½		BTS-68	
R40	100KΩ	½		BTS-100K	
R41	27KΩ	½		BTS-27K	
R42	22KΩ	2		BTB-22K	
R43	2200Ω	½		BTS-2200	
R44	100KΩ	½		BTS-100K	
R45	100KΩ	½		BTS-100K	
R46	220Ω	½		BTS-220	Note 2
R47	22KΩ	2		BTB-22K	
R48	2200Ω	½		BTS-2200	
R49	27KΩ	½		BTS-27K	
R50	470KΩ	½		BTS-470K	
R51	1Meg	½		BTS-1Meg	
R52	220KΩ	½		BTS-220K	
R53	1Meg	½		BTS-1Meg	
R54	3.3Meg	½		BTS-3.3Meg	
R55	2200Ω	½		BTS-2200	
R56	27KΩ	½		BTS-27K	
R57	1Meg	½		BTS-1Meg	
R58	1Meg	½		BTS-1Meg	
R59	1Meg	½		BTS-1Meg	
R60	2200Ω	½		BTS-2200	
R61	27KΩ	½		BTS-27K	
R62	3300Ω	½		BTS-3300	
R63	220KΩ	½		BTS-220K	
R64	220KΩ	½		BTS-220K	
R65	100KΩ	½		BTS-100K	
R66	68KΩ	½		BTS-68K	
R67	33KΩ	½		BTS-33K	
R68	91Ω 5%	1			

Note 1. Some models may use a 2200Ω resistor in this application.
Note 2. Some models may use a 2400Ω resistor in this application.

PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (POWER)

ITEM No.	RATING				REPLACEMENT DATA					
	PRI.	SEC. 1	SEC. 2	SEC. 3	BROWNING PART No.	Stancor PART No.	Merit PART No.	Triad PART No.	Halldorson PART No.	Thordarson PART No.
T1	117VAC @ .79A	560VCT .099ADC	5VAC @ 2A	6.3VAC @ 4.6A	GEN-87	PC-8405 ①②		R-12A ①	P9312 ①	22R05 ①

① Tape 6.3V center tap.
② Drill new mounting holes.

COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA				NOTES
		PRI.	SEC.	BROWNING PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L1	FM Ant. Coil	0Ω	0Ω					
L2	FM RF Choke	.1Ω			19-1000		4602	1Microhenry
L3	FM RF Coil	0Ω						Tapped
L4	FM Osc. Coil	0Ω						Tapped
L5	AM Ant. Coil	.6Ω			19-1003		4608	5Microhenries
L6	AM Ant. Coil	5Ω	3.9Ω		14-7413	BC-412	43-A	
L7	AM RF Coil	87Ω	3.4Ω		14-1023	BC-413	43-RF	
L8	AM Osc. Coil	.8Ω	9Ω		14-1074■	BC-381*	70-Osc. ■	
L9	1st FM IF	1.3Ω	1.3Ω	16486-1	16-3487	FM-254	1463	
L10	1st AM IF	16Ω	16Ω	14487				
L11	2nd FM IF	1.3Ω	1.3Ω	16486-1	16-3487	FM-254	1463	
L12	2nd AM IF	16Ω	16Ω	14488				
L13	3rd FM IF	1.3Ω	1.3Ω	16486-1	16-3487	FM-254	1463	
L14	Discriminator	1.2Ω	1.4CT	15808	17-3484▲	FM-253	1464	
L15	Whistle Filter	125Ω					EL-60*	

* Drill mounting hole.
■ Leads sufficient mounting support.
▲ Cut out chassis hole and drill mounting holes.

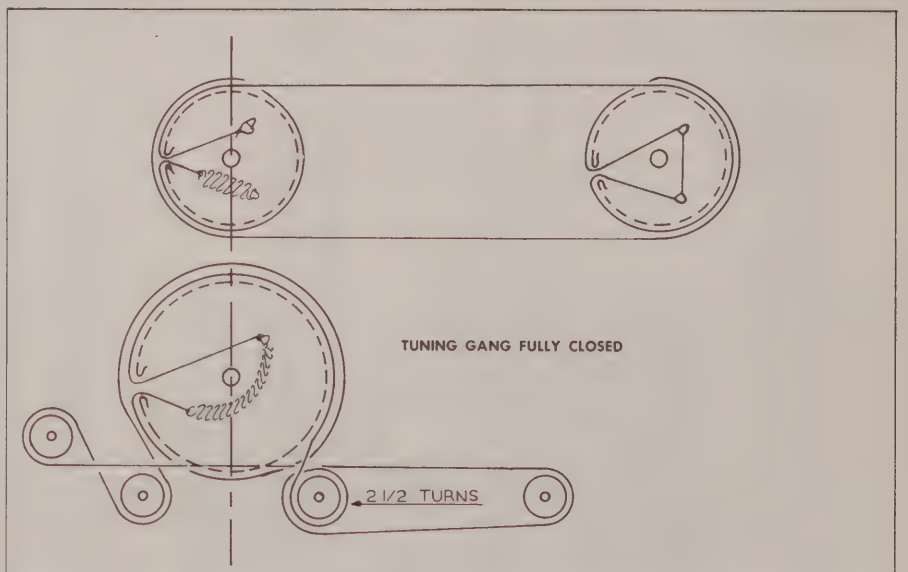
FILTER CHOKE

ITEM No.	RATINGS			REPLACEMENT DATA					
	TOTAL DIRECT CURRENT	D. C. RESISTANCE	INDUCTANCE (0 CURRENT 1000 ∿)	BROWNING PART No.	Stancor PART No.	Merit PART No.	Triad PART No.	Halldorson PART No.	Thordarson PART No.
L16	.099A	154Ω	4.35HY	RGC-7	C-1709		C-9X	C5020	20C64 ①

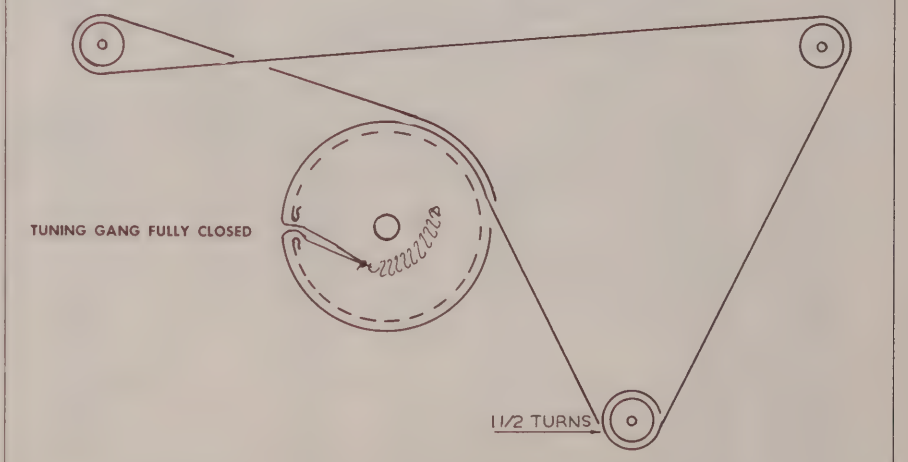
① Drill one new mounting hole.

MISCELLANEOUS

ITEM No.	PART NAME	BROWNING PART No.	NOTES
M1	Dial Light		#1830 Bayonet
M2	Dial Light		#1830 Bayonet
M3	Tuning Cap.	273351C	AM-24-383MMF; 24-383MMF; 33-395MMF
M4	Tuning Cap.	4137	FM
M5	Switch		On-Off-Selector

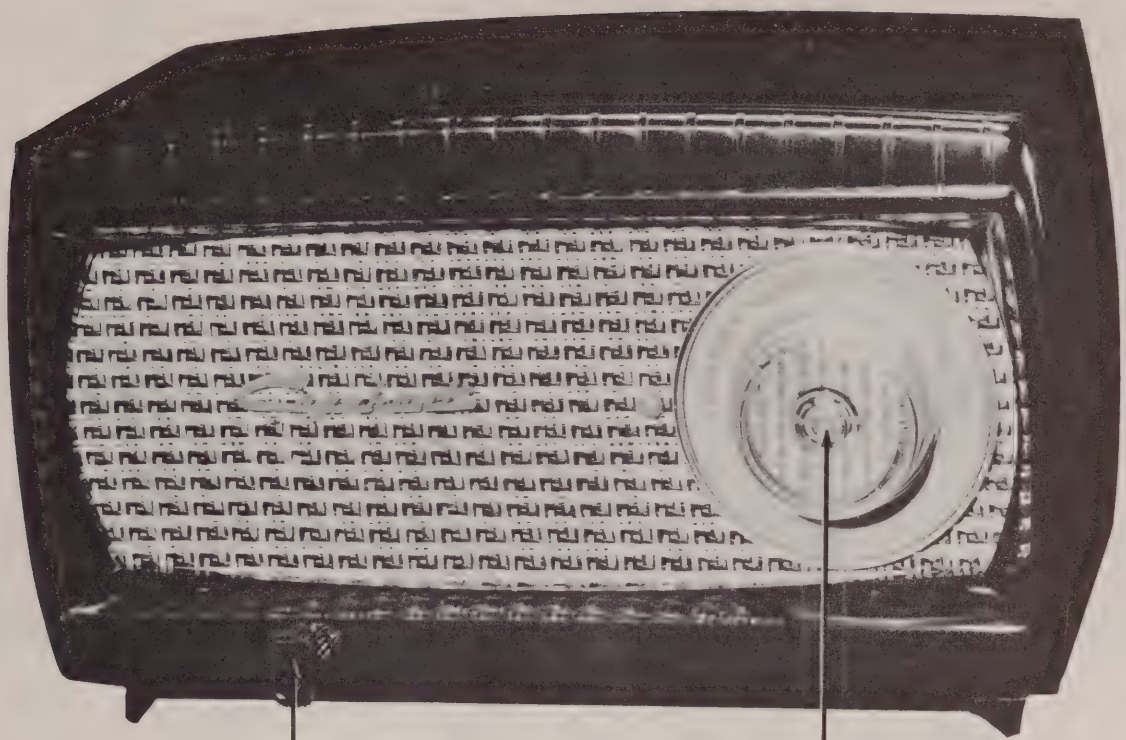


FM DIAL CORD STRINGING



AM DIAL CORD STRINGING

CAPEHART MODELS 2T55
(Ch. CR-154), 3T55 (Ch. CR-150)



CAPEHART MODELS 2T55
(Ch. CR-154), 3T55 (Ch. CR-150)

TRADE NAME	Capehart Model 2T55 (Ch. CR-154), 3T55 (Ch. CR-150)
MANUFACTURER	Capehart-Farnsworth Corp., Fort Wayne, Ind.
TYPE SET	AC-DC Operated AM Superheterodyne Receiver
TUBES (Five)	Types 12BE6 Conv., 12BA6 IF Amp., 12AV6 Det-AVC-AF Amp., 50C5 Output, 35W4 Rectifier
POWER SUPPLY	105-125 Volts AC-DC RATING .24 Amp. @ 117 Volts AC
TUNING RANGE—BROADCAST	540-1620KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Use isolation transformer, if available. If not, connect a .1MFD capacitor in series with low side of signal generator and B-.
Loop should be maintained in same relative position to chassis as when receiver in cabinet.
Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1	.1MFD	High side to antenna stator lug on tuning gang. Low side to B-	455KC (400~ Mod.)	Tuning gang fully open.	Across voice coil.	A1, A2, A3, A4	Adjust for maximum output. If isolation transformer is not used, reduce dummy antenna to .001MFD to reduce hum modulation.
2	"	"	1620KC	"	"	A5	"
3		Loop	1400KC	Tune to 1400KC signal.	"	A6	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.

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PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA, GENERAL ELECTRIC, WESTINGHOUSE)

ITEM No.	USE	REPLACEMENT DATA		RETMA BASE TYPE	NOTES
		CAPEHART PART No.	STANDARD REPLACEMENT		
V1	Converter	12BE6	12BE6	7CH	
V2	IF Amp.	12BA6	12BA6	7BK	
V3	Det-AVC-AF Amp.	12AV6	12AV6	7BT	
V4	Output	50C5	50C5	7CV	
V5	Rectifier	35W4	35W4	5BQ	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	CAPEHART PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C1A	50	150		PRS150/50-50		BR5515		2N521	TVA-2453	Red
B	50	150								Yellow
C2	.047	200		P288-047	DF-503	PJ2S47		PT4147	2TM-S47	
C3	470			SI470	D6-471	TP46	GP2K-471	UC-5347	5GA-T47	
C4	56			SI56	D6-560	TP31	GP1K-560	UC-5456	5GA-Q56	
C5	150			SI150NP0	TCZ-151	TP36	NP0K-151	ZT-5315	5TCC-T15	
C6A	220									
B	2000									
C	5000			♦PA-113-1	♦PC-150	♦116TM1	♦1408-02		♦DT-1	
D	250									
E										
C7	.02	600		P688-02		CUB6S2		PT612	6TM-S2	
C8	.02	600		689ZX-02		CUB6S2		PT612	6TM-S2	
C9	.047	600		P688-047	DF-503	CUB6S47		PT6147	6TM-S47	

♦ Items C6A, C6B, C6C, C6D, C6E, R7A, R7B and R7C are combined in one unit.
When replacing items separately, items C6D and C6E should total 250 MMF.

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	CAPEHART PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	
R1A	500KΩ	½	453786A1	Q13-133	A47-500K-Z	AB-60	V48	Volume
B	Shaft		Not Req.	Not Req.	KSS-3	AK-4	Not Req.	Attach to R1A
C	Switch		Not Req.	76-1	SWE-12	KB-1	US-26	Attach to R1A

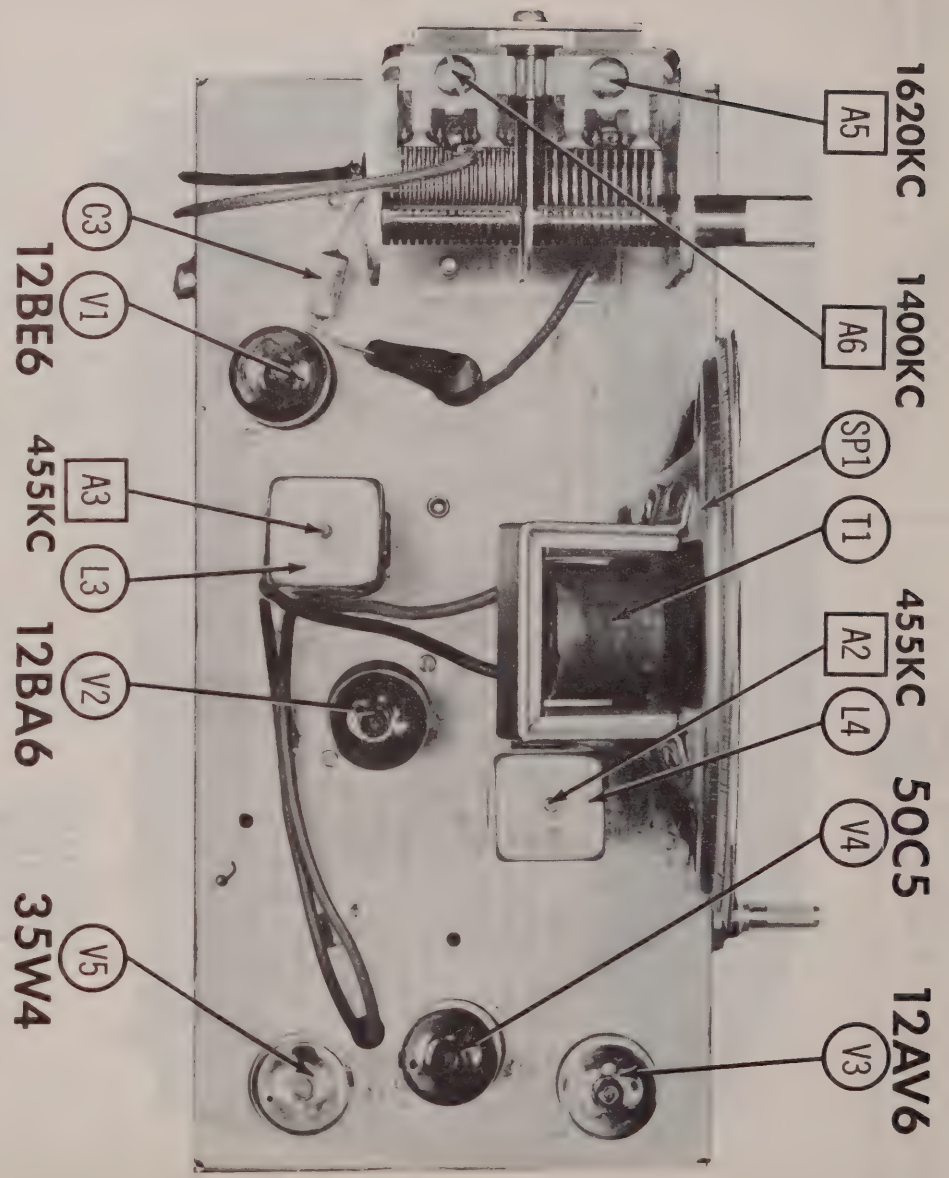
RESISTORS

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	CAPEHART PART No.	IRC PART No.	
R2	100Ω	½		BTS-100	
R3	1Meg	½		BTS-1Meg	
R4	22KΩ	½		BTS-22K	
R5	100Ω	½		BTS-100	
R6	3.3Meg	½		BTS-3.3Meg	

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	CAPEHART PART No.	IRC PART No.	
R7A	6.8Meg	½	♦	BTS-6.8Meg	
B	470KΩ	½		BTS-470K	
C	150Ω	½		BTS-150	
R9	1500Ω	1		BTA-1500	
R10	220KΩ	½		BTS-220K	

♦ Itmes R7A, R7B, R7C, C6A, C6B, C6C, C6D and C6E are combined in one unit.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	CAPEHART PART No.	Stancor PART No.	Merit PART No.	Triad PART No.	Halldorson PART No.	Thordarson PART No.	
T1	2.25KΩ	3.3Ω	Part of Speaker	A-3332	A-3025	S-12X	Z1101		

SPEAKER

ITEM No.	RATINGS			REPLACEMENT DATA			NOTES
	SIZE	FIELD	V. C. IMP.	CAPEHART PART No.	VIKING PART No.	QUAM PART No.	
SP1	4"	PM	3.3Ω	750204B-3	4J6	4A07	

COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA				NOTES
		PRI.	SEC.	CAPEHART PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L1	Loop Ant.	2.8Ω						Includes cabinet back
L2	Osc. Coil	.4Ω	4.6Ω		14-1074*	BC-381	71-Osc.	
L3	Input IF	14Ω	14Ω		16-6758	BC-352	12-C1	
L4	Output IF	14Ω	14Ω		16-6758	BC-353	12-C2	

MISCELLANEOUS

ITEM No.	PART NAME	CAPEHART PART No.	NOTES
M1	Tuning Cap.	650847A-1	33-480MMF; 22-168MMF.
	Cabinet	850308A-1	Ebony - Model 3T55
	Cabinet	850308A-2	Brown - Model 3T55
	Cabinet	850308A-3	Ivory - Model 3T55
	Cabinet	850308A-4	Green - Model 3T55
	Cabinet	850309A-1	Ebony - Model 2T55
	Cabinet	850309A-2	Brown - Model 2T55
	Cabinet	850309A-3	Ivory - Model 2T55
	Knob	750526A-1	Tuning - Model 3T55 - All cabinets
	Knob	452740A-16	On-Off-Volume - Model 3T55 - Ebony Cabinets
	Knob	452740A-18	On-Off-Volume - Model 3T55 - Brown Cabinets
	Knob	452740A-20	On-Off-Volume - Model 3T55 - Ivory Cabinets
	Knob	452740A-22	On-Off-Volume - Model 3T55 - Green Cabinets
	Knob	750529A-1	Tuning - Model 2T55 - Ebony Cabinets
	Knob	750529A-2	Tuning - Model 2T55 - Brown Cabinets
	Knob	750529A-3	Tuning - Model 2T55 - Ivory Cabinets
	Knob	452740A-17	On-Off-Volume - Model 2T55 - Ebony Cabinets
	Knob	452740A-19	On-Off-Volume - Model 2T55 - Brown Cabinets
	Knob	452740A-21	On-Off-Volume - Model 2T55 - Ivory Cabinets

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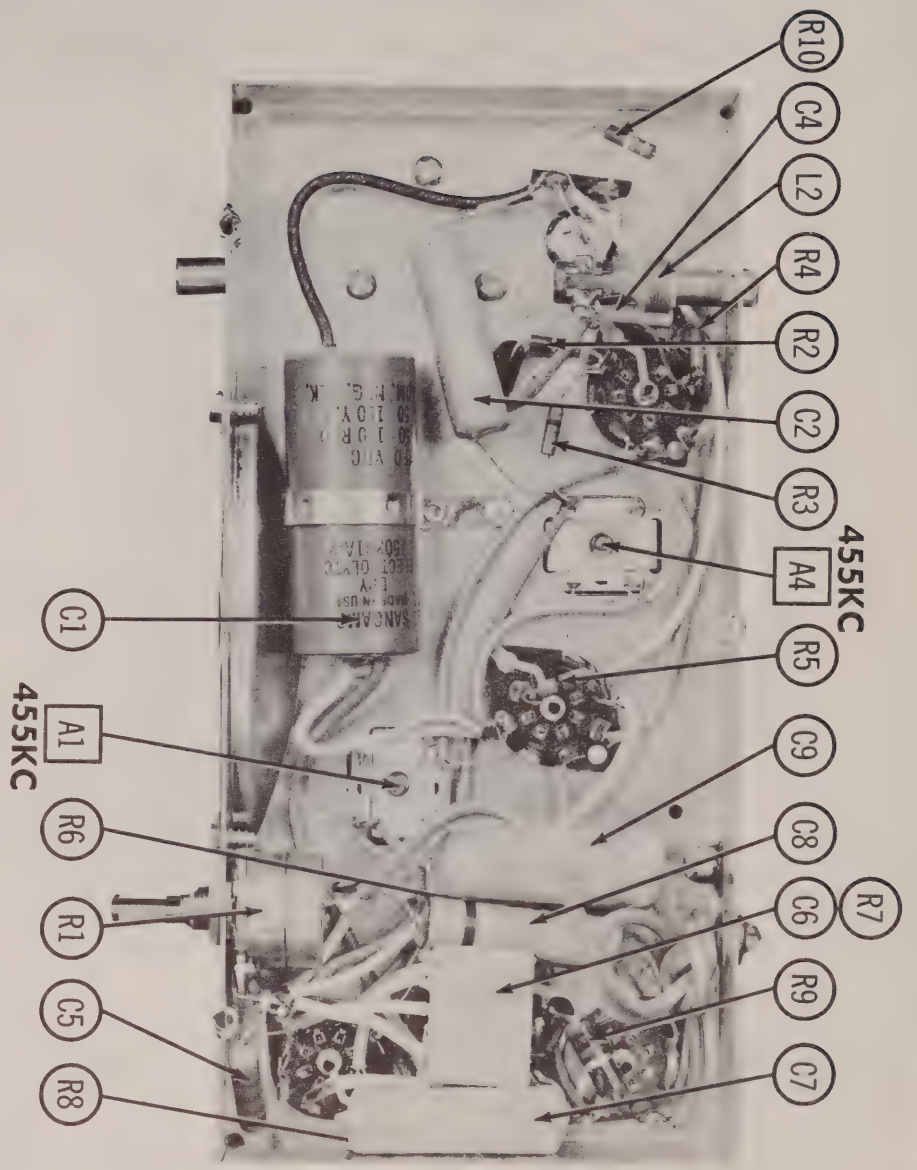
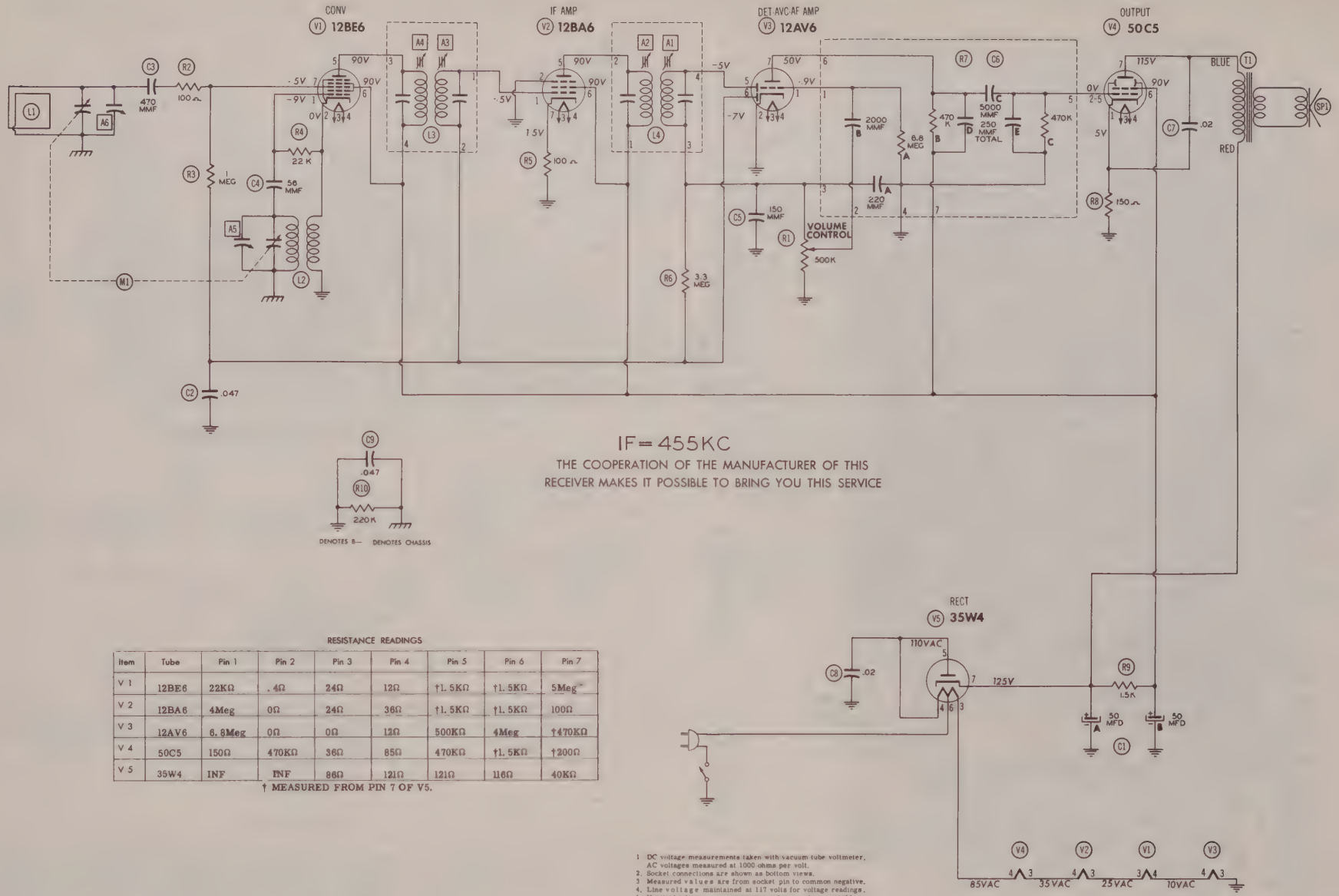
CHASSIS—BOTTOM VIEW



CAPEHART
MODEL 2T55 (Ch. CR-154)



RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V 1	12BE6	22KΩ	.4Ω	24Ω	12Ω	†1.5KΩ	†1.5KΩ	5Meg
V 2	12BA6	4Meg	0Ω	24Ω	36Ω	†1.5KΩ	†1.5KΩ	100Ω
V 3	12AV6	6.8Meg	0Ω	0Ω	13Ω	500KΩ	4Meg	†470KΩ
V 4	50C5	150Ω	470KΩ	36Ω	85Ω	470KΩ	†1.5KΩ	†200Ω
V 5	35W4	INF	INF	86Ω	121Ω	121Ω	116Ω	40KΩ

† MEASURED FROM PIN 7 OF V5.

1. DC voltage measurements taken with vacuum tube voltmeter. AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings
6. Volume control at maximum, no signal applied for voltage measurements.

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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CBS COLUMBIA
MODEL 5220

TRADE NAME	CBS Columbia Model 5220
MANUFACTURER	CBS Columbia, Div. of Columbia Broadcasting System, Long Island City 1, N. Y.
TYPE SET	Three Power Portable AM Superheterodyne Receiver
TUBES (FOUR)	Types 1R5 Conv., 1U4 IF Amp., 1U5 Det. -AVC-AF Amp., 3V4 Output
POWER SUPPLY	110-120 Volts AC-DC (or) 7.5 Volts "A" Supply & 67.5 Volts "B" Supply
RATING	.12 Amp. @ 117 Volts AC (or) 60MA @ 7.5 Volts DC & 12MA @ 67.5 Volts DC
TUNING RANGE—BROADCAST	535KC - 1620KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.
Loop should be maintained in same relative position to chassis as when receiver in cabinet.
Use battery power, if possible. If AC power is used, use an isolation transformer when available. If not, connect a .1MFD capacitor in series with low side of the signal generator and B-.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1	.1MFD	High side to pin 6 (grid) of 1R5 (V1). Low side to chassis.	455K (400~ Mod.)	Tuning gang fully open.	Across voice coil	A1, A2 A3, A4	Adjust for maximum output. If AC power is used without an isolation transformer, reduce dummy antenna to 200MMF to reduce hum modulation.
2	"	"	1620KC	"	"	A5	"
3		Loop	1400KC	Tune to 1400KC signal.	"	A6	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.

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PARTS LIST AND DESCRIPTIONS

CBS COLUMBIA MODEL 5220

TUBES (SYLVANIA, GENERAL ELECTRIC, WESTINGHOUSE)

ITEM No.	USE	REPLACEMENT DATA		RETMA BASE TYPE	NOTES
		CBS COLUMBIA PART No.	STANDARD REPLACEMENT		
V1	Converter	1R5	1R5	7AT	
V2	IF Amp	1U4	1U4	6AR	
V3	Det-AVC-AF Amp.	1U5	1U5	6BW	
V4	Output	3V4	3V4	6BX	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	CBS COLUMBIA PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C1A	■60	150	21000011	PRS106D20A		CO57				
B	▲40	150								
C	100	25								
C2	.05	200	22025740	P288-05	DF-503	PJ-2S5		PT415	2TM-S5	
C3	220		23064900	SI220	D6-221	TP39	GP2K-221	UC-5322	5GA-T22	
C4	10000		23065920	BPD-01	DD-103	K082	811-01	DC-511	5HK-SI	
C5	.1	200	22025780	P288-1	DF-104	PJ2P1		PT401	2TM-P1	
C6	1000		23065570	BPD-001	DD-102	K069	801-001	DC-521	5HK-SI	
C7	220		23002660	SI220	D6-221	TP39	GP2K-221	UC-5322	5GA-T22	
C8A	150									
B	2000									
C	150		♦82000043	♦PA-136	♦PC-160				♦DT-1	
D	10000									
E	5000									
C9	.1	400	22026280	P488-1	DF-104	CUB4P1		PT401	4TM-P1	
C10	1000		23066000	BPD-01	DD-103	K082	811-01	DC-511	5HK-SI	
C11	.047	400	22017240	489ZX-047	DF-503	PJ4S47		PT4147	4TM-S47	
C12	.1	400	22026280	P488-1	DF-104	CUB4P1		PT401	4TM-P1	

♦ Items C8A, C8B, C8C, C8D, C8E, R7A, R7B, R7C and R7D are combined in one unit.

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	CBS Columbia PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	
R1A	2Meg	½	36000982	Q13-139	A47-2Meg-Z	AB-76	U55	Volume
B	Shaft		Not Req.	Not Req.	KSS-3	AK4	Not Req.	Attach to R1A
C	Switch		Not Req.	76-2	SWE20	KB2	US-27	Attach to R1A

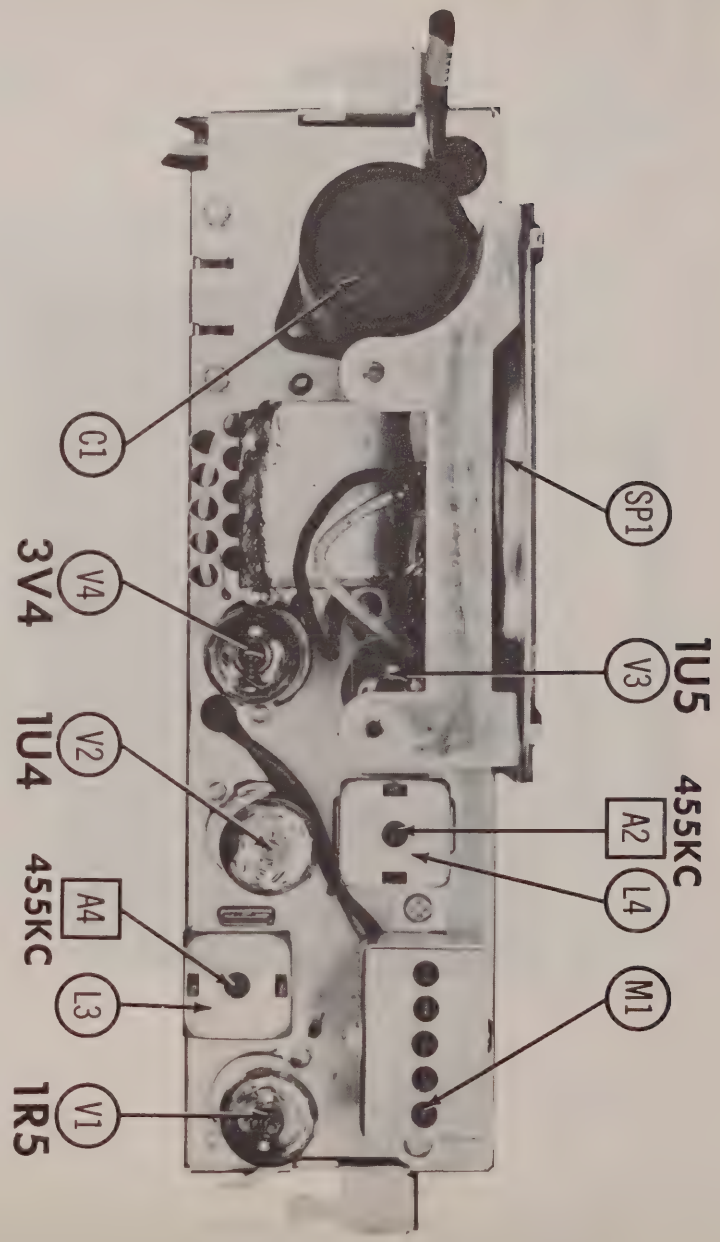
RESISTORS

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	CBS Columbia PART No.	IRC PART No.	
R2	100KΩ	½	30104230	BTS-100K	
R3	1Meg	½	30105230	BTS-1Meg	
R4	4700Ω	½	30472230	BTS-4700	
R5	10Meg	½	30106230	BTS-10Meg	
R6	3.3Meg	½	30335230	BTS-3.3Meg	
R7A	10Meg	½	♦82000043		
B	4.7Meg	½			
C	10Meg	½			
D	3.3Meg	½			

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	CBS Columbia PART No.	IRC PART No.	
R8	270KΩ	½	30274230	BTS-270K	
R9	680Ω	½	30681130	BTS-680	
R10	150Ω	½	30151130	BTS-150	
R11	75Ω	2	33000061		
R12A	750Ω	10	31000011		
B	1500Ω	10			

♦ Items R7A, R7B, R7C, R7D, C8A, C8B, C8C, C8D, and C8E are combined in one unit.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	CBS Columbia PART No.	Stancor PART No.	Merit PART No.	Triad PART No.	Halldorson PART No.	Thordarson PART No.	
T1	7KΩ	3.2Ω	10000421	A-3329	A-2927 ①	S-8X	Z1110	24S49	① Drill one new mounting hole.

SPEAKER

ITEM No.	RATINGS			REPLACEMENT DATA			NOTES
	SIZE	FIELD	V. C. IMP.	CBS Columbia PART No.	JENSEN PART No.	QUAM PART No.	
SP1	4"	PM	3.2Ω	73000282 73000281 ①	ST-113 Mod. P4-X	4A1	① Alternate speaker

COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA				NOTES
		PRI.	SEC.	CBS Columbia PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L1	Ant. Coil	.6Ω		79000241				
L2	Osc. Coil	.8Ω	5.5Ω	15000461	14-1073 ■		69-Osc. ■	
L3	Input IF	20Ω	20Ω	12000441	16-6758	BC-352	12-C1	
L4	Output IF	24Ω *	24Ω	12000451				

* Tapped at .5Ω.
■ Leads sufficient mounting support.

SELENIUM RECTIFIER

ITEM No.	RATING	REPLACEMENT DATA						NOTES
	CURRENT	CBS Columbia PART No.	FEDERAL PART No.	INTERNATIONAL PART No.	MALLORY PART No.	SARKES TARZIAN PART No.	SELETRON PART No.	
M1	.060	62000021	1003	RS75	6S75	75	5M4	

BATTERIES

ITEM No.	VOLTAGE	CBS Columbia PART No.	REPLACEMENT DATA						INSTALLATION NOTES
			EVEREADY			BURGESS			
			"A"	"B"	"A-B"	"A"	"B"	"A-B"	
M2	7.5V		717			C5			
M3	67.5V			477			P45		

MISCELLANEOUS

ITEM No.	PART NAME	CBS Columbia PART No.	NOTES
M4	Tuning Cap	24000011	35-355 MMF, 14-103 MMF
M5	Switch	40000251	Change-over switch
	Cabinet	70000871	Sand
	Cabinet	70000881	Maroon
	Cabinet	70000891	Gray
	Cabinet	70000901	Green
	Handle	88000051	Sand
	Handle	88000052	Maroon
	Handle	88000053	Gray
	Handle	88000054	Green
	Knob	76002335	Tuning (Sand)
	Knob	76002334	Tuning (Maroon)
	Knob	76002336	Tuning (Gray)
	Knob	76002333	Tuning (Green)
	Knob	76001055	Volume (Sand)
	Knob	76001054	Volume (Maroon)
	Knob	76001056	Volume (Gray)
	Knob	76001050	Volume (Green)

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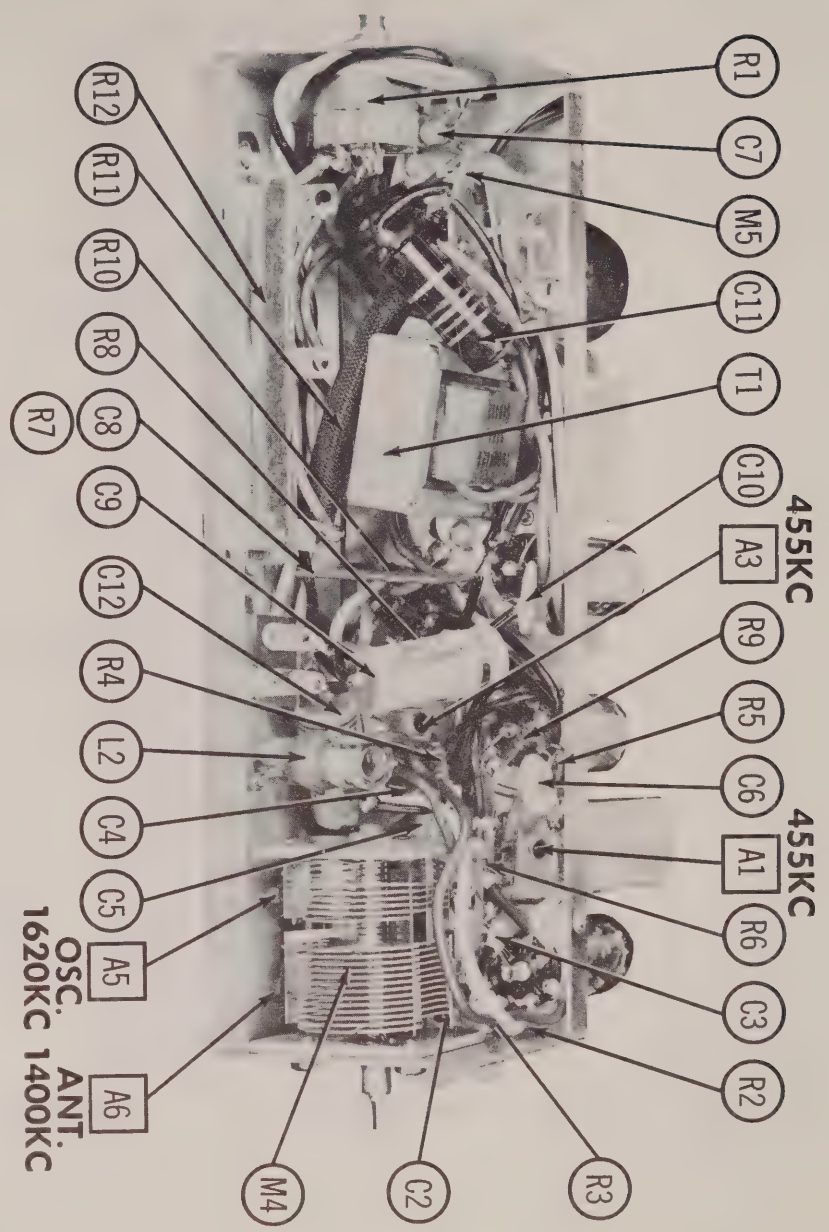
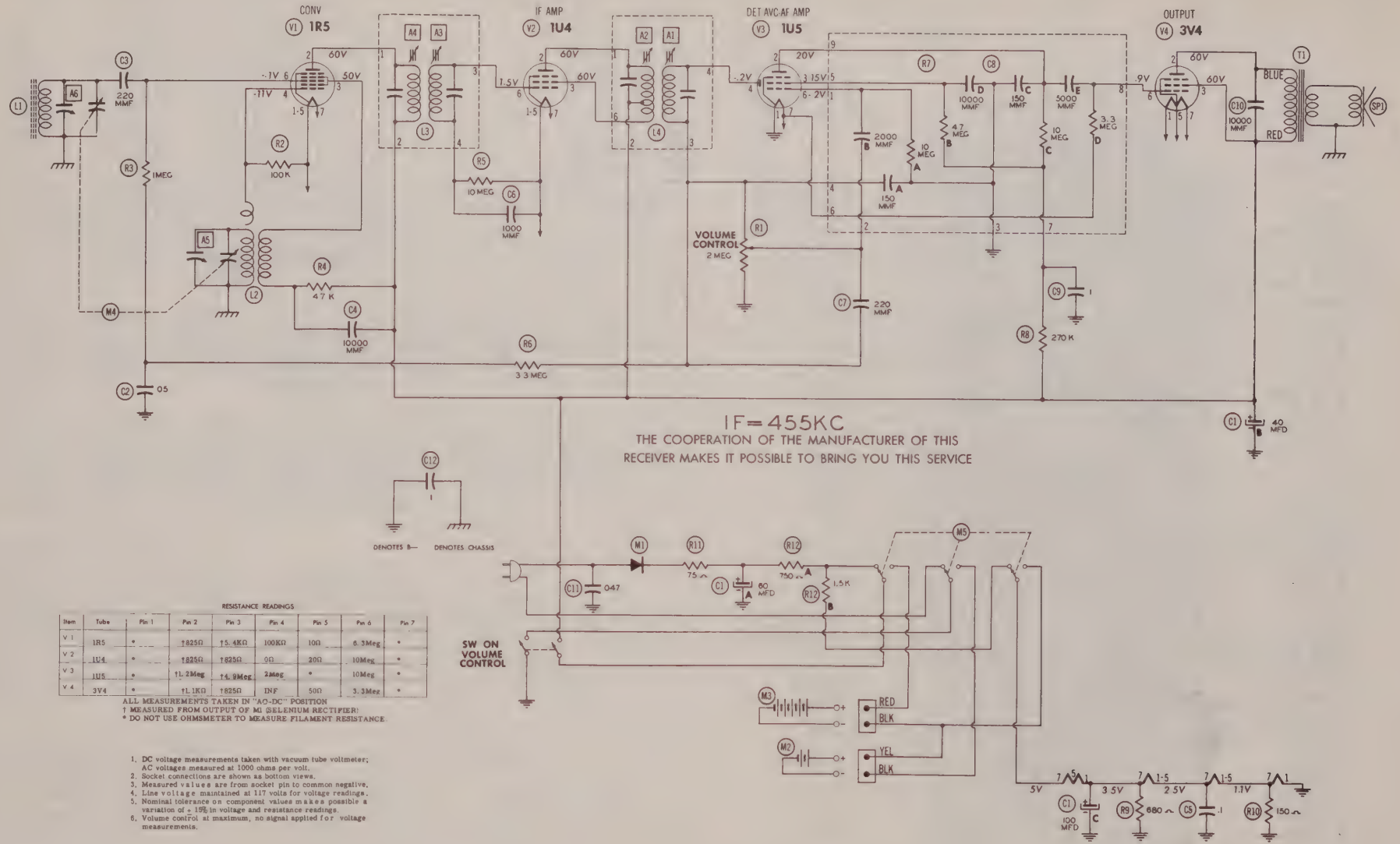
CHASSIS—BOTTOM VIEW



CBS COLUMBIA
MODEL 5220

CBS COLUMBIA
MODEL 5220



RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V 1	1R5	*	†825Ω	†5.4KΩ	100KΩ	10Ω	6.3Meg	*
V 2	1U4	*	†825Ω	†825Ω	0Ω	20Ω	10Meg	*
V 3	1U5	*	†1.2Meg	†4.9Meg	2Meg	*	10Meg	*
V 4	3V4	*	†1.1KΩ	†825Ω	INF	50Ω	3.3Meg	*

ALL MEASUREMENTS TAKEN IN "AC-DC" POSITION
† MEASURED FROM OUTPUT OF M1 (SELENIUM RECTIFIER)
* DO NOT USE OHMSMETER TO MEASURE FILAMENT RESISTANCE.

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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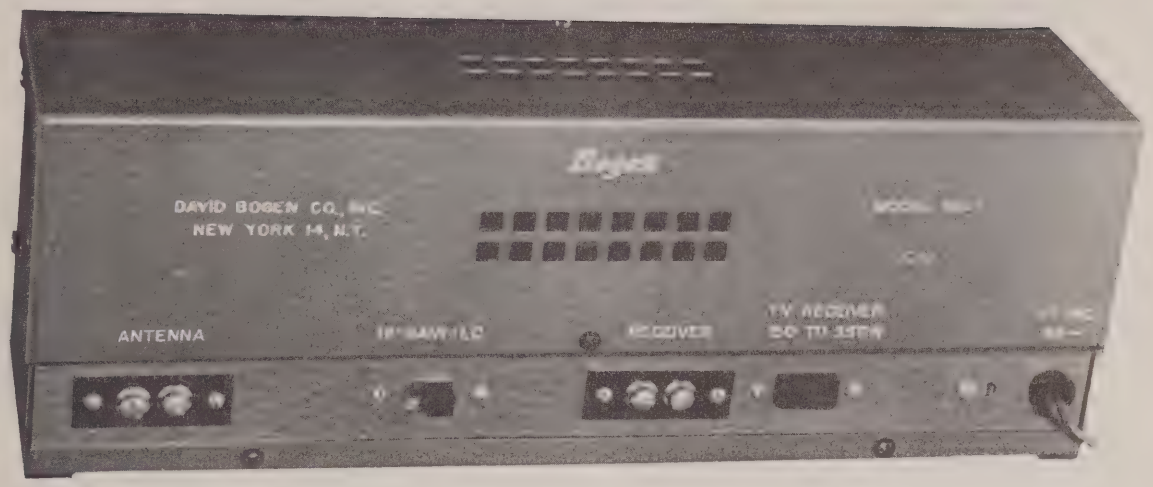
DAVID BOGEN
B1B-1



DAVID BOGEN
B1B-1

TRADE NAME	David Bogen Model B1B-1
MANUFACTURER	David Bogen Co., Inc., 29 Ninth Ave., New York, 14, N.Y.
TYPE SET	AC Operated VHF Television Signal Booster
TUBES (Four)	Types (4) 6J6 RF Amp.
POWER SUPPLY	110-120 Volts AC-60 Cycles RATING .12 Amp. @ 117 Volts AC
TUNING RANGE -	Channes 2 - 13

HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

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PARTS LIST AND DESCRIPTIONS

DAVID BOGEN
MODEL B1B-1

TUBES (SYLVANIA, GENERAL ELECTRIC, WESTINGHOUSE)

ITEM No.	USE	REPLACEMENT DATA		RETMA BASE TYPE	NOTES
		David Bogen PART No.	STANDARD REPLACEMENT		
V1	RF Amplifier	6J6	6J6	7BF	
V2	RF Amplifier	6J6	6J6	7BF	
V3	RF Amplifier	6J6	6J6	7BF	
V4	RF Amplifier	6J6	6J6	7BF	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	David Bogen PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C1A	■40	150		AFH2-15		B015		FP213	TVL-2432	Note 1
B	▲30	150								Note 1
C	10	150								Note 1
C2	500			SI500	D6-501	TM5T5	GP2K-501	UC-535	5GA-T5	
C3	500			SI500	D6-501	TM5T5	GP2K-501	UC-535	5GA-T5	
C4	1.2									
C5	1.2									
C6	500			SI500	D6-501	TM5T5	GP2K-501	UC-535	5GA-T5	
C7	500			SI500	D6-501	TM5T5	GP2K-501	UC-535	5GA-T5	
C8	1.2									
C9	1.2									
C10	500			SI500	D6-501	TM5T5	GP2K-501	UC-535	5GA-T5	
C11	500			SI500	D6-501	TM5T5	GP2K-501	UC-535	5GA-T5	
C12	1.2									
C13	1.2									
C14	500			SI500	D6-501	TM5T5	GP2K-501	UC-535	5GA-T5	
C15	500			SI500	D6-501	TM5T5	GP2K-501	UC-535	5GA-T5	
C16	1.2									
C17	1.2									
C18	500			SI500	D6-501	TM5T5	GP2K-501	UC-535	5GA-T5	
C19	500			SI500	D6-501	TM5T5	GP2K-501	UC-535	5GA-T5	
C20	.01	600		P688-01		PTE6S1		PT611	6TM-S1	Note 2

Note 1. C1C is not used. Some models use 50MFD (C1A), 30MFD (C1B) in this application.

RESISTORS

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	David Bogen PART No.	IRC PART No.	
R1	150Ω	½		BTS-150	
R2	150Ω	½		BTS-150	
R3	47Ω	½		BTS-47	
R4	150Ω	½		BTS-150	
R5	2700Ω	½		BTS-2700	
R6	10KΩ	½		BTS-10K	
R7	47Ω	½		BTS-47	
R8	10KΩ	½		BTS-10K	
R9	150Ω	½		BTS-150	
R10	10KΩ	½		BTS-10K	

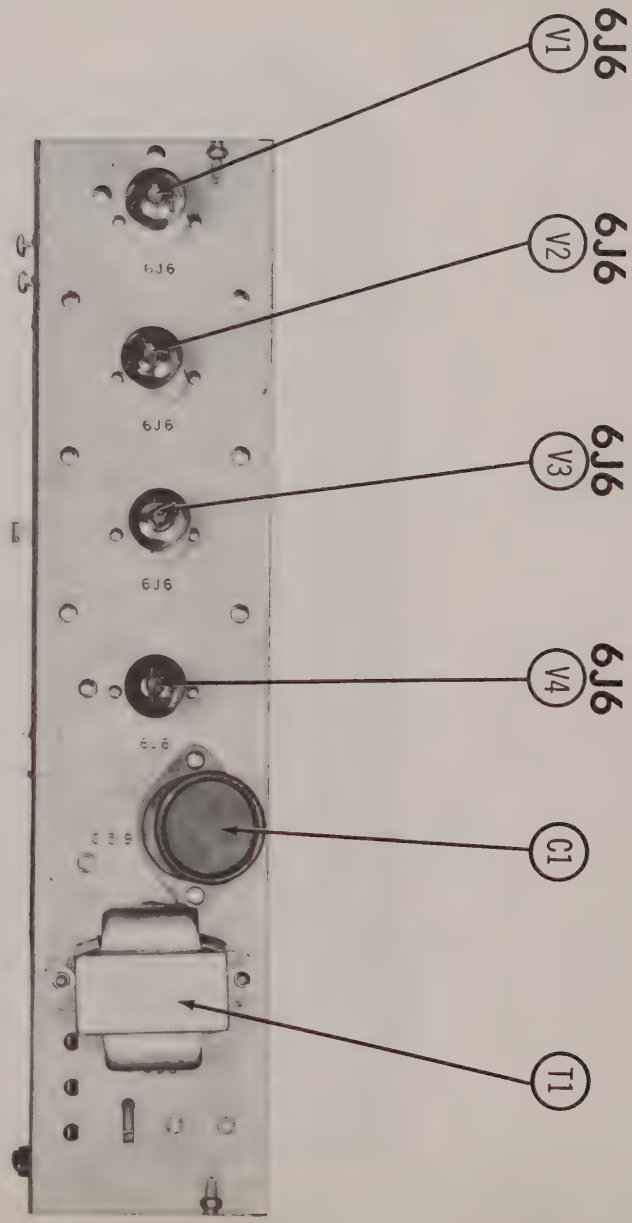
ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	David Bogen PART No.	IRC PART No.	
R11	47Ω	½		BTS-47	
R12	10KΩ	½		BTS-10K	
R13	150Ω	½		BTS-150	
R14	10KΩ	½		BTS-10K	
R15	47Ω	½		BTS-47	
R16	10KΩ	½		BTS-10K	
R17	150Ω	½		BTS-150	
R18	1500Ω	1		BTA-1500	Note 1
R19	100Ω	2		BTB-100	
R20	25Ω	2			Note 2

Note 1. Some models may use a 4700Ω, 2 watt resistor in this application.
Note 2. Some models may use a 22Ω resistor in this application.

TRANSFORMER (FILAMENT)

ITEM No.	RATING				REPLACEMENT DATA					
	PRI.	SEC. 1	SEC. 2	SEC. 3	David Bogen PART No.	Stancor PART No.	Merit PART No.	Triad PART No.	Halldorson PART No.	Thordarson PART No.
T1	117VAC @ .12A	18VAC @ .45A			T-398					

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA				NOTES
		PRI.	SEC.	David Bogen PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L1	Ant. Coupling	0Ω		U404-1				
L2	Ant. Coupling	0Ω		U404-1				
L3	Ant. Coil	0Ω		U404-10				
L4	RF Choke	0Ω		U404-4				
L5	RF Choke	0Ω		U404-7				
L6	RF Choke	0Ω		U404-7				
L7	RF Choke	0Ω		U404-4				
L8	RF Choke	0Ω		U404-5				
L9	RF Choke	0Ω		U404-9				
L10	RF Choke	0Ω		U404-9				
L11	RF Choke	0Ω		U404-5				
L12	RF Choke	0Ω		U404-3				
L13	RF Choke	0Ω		U404-6				
L14	RF Choke	0Ω		U404-6				
L15	RF Choke	0Ω		U404-3				
L16	RF Choke	0Ω		U404-2				
L17	RF Choke	0Ω		U404-8				
L18	RF Choke	0Ω		U404-8				
L19	RF Choke	0Ω		U404-2				

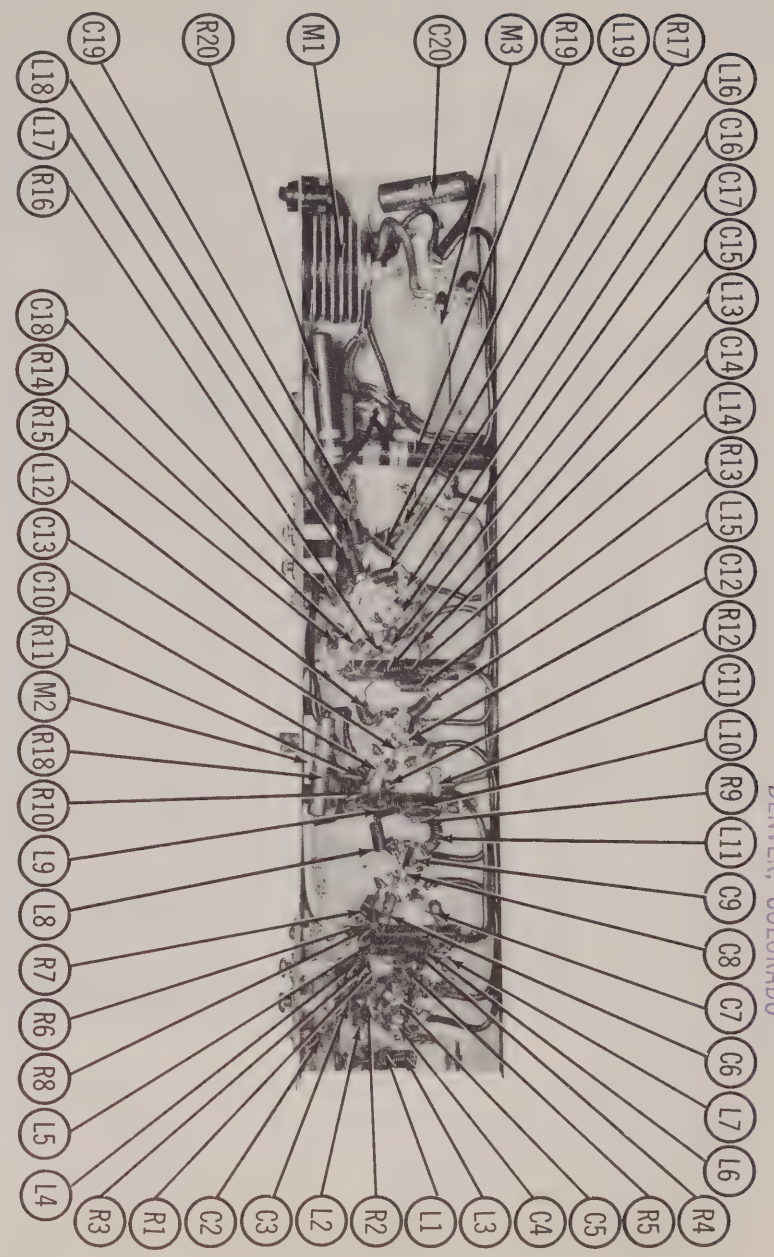
SELENIUM RECTIFIER

ITEM No.	RATING	REPLACEMENT DATA						NOTES
	CURRENT	David Bogen PART No.	FEDERAL PART No.	INTERNATIONAL PART No.	MALLORY PART No.	SARKES TARZIAN PART No.	SELETRON PART No.	
M1	.076ADC		1005A	RS150	6S100	150	5P1	

MISCELLANEOUS

ITEM No.	PART NAME	David Bogen PART No.	NOTES
M2	Switch		Hi-Lo Gain (Wirt Co. SPST)
M3	Relay		R687

CHASSIS—BOTTOM VIEW



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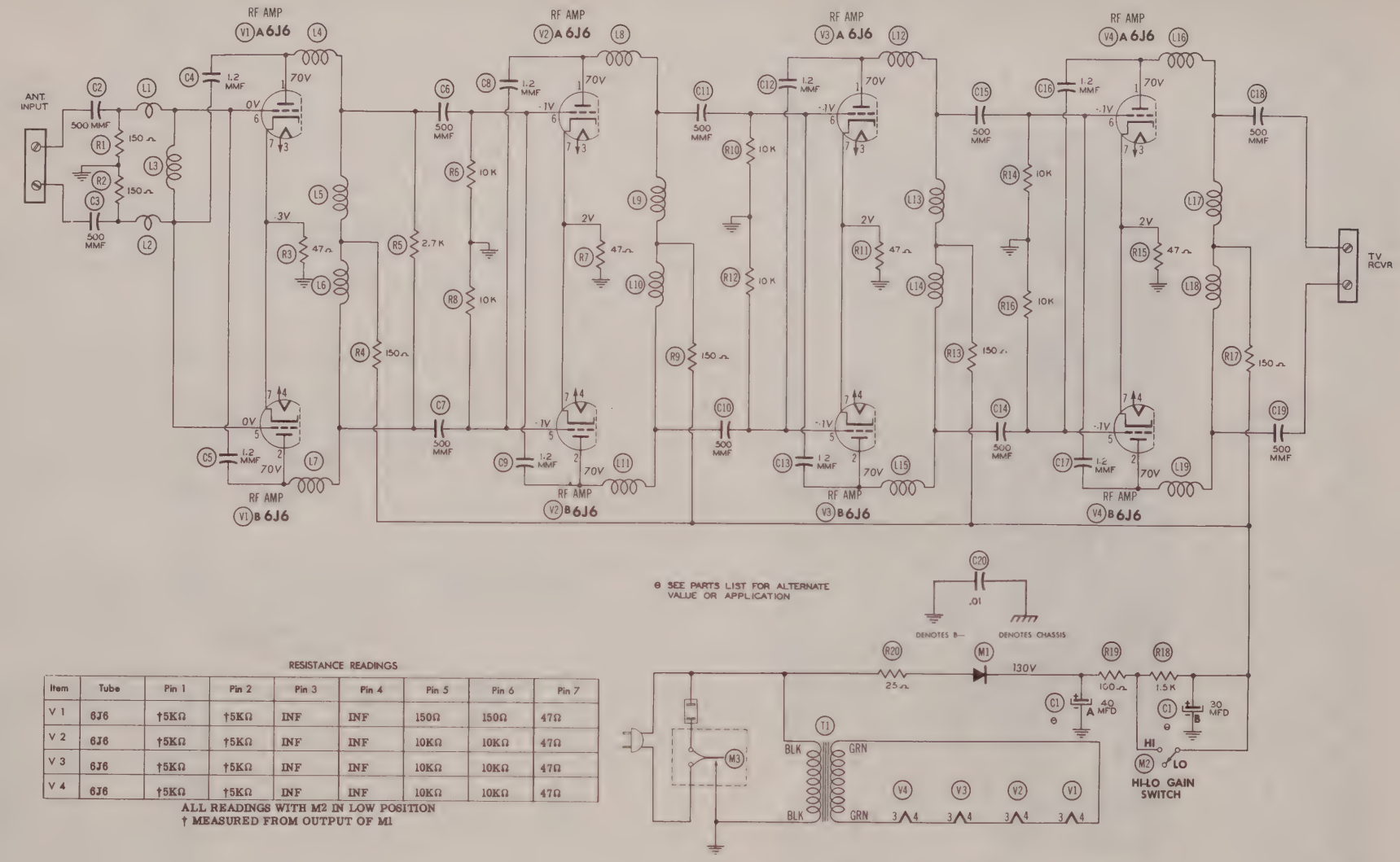
DAVID BOGEN
MODEL BIB-1

DAVID BOGEN
MODEL BIB-1



RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V 1	6J6	†5KΩ	†5KΩ	INF	INF	150Ω	150Ω	47Ω
V 2	6J6	†5KΩ	†5KΩ	INF	INF	10KΩ	10KΩ	47Ω
V 3	6J6	†5KΩ	†5KΩ	INF	INF	10KΩ	10KΩ	47Ω
V 4	6J6	†5KΩ	†5KΩ	INF	INF	10KΩ	10KΩ	47Ω

ALL READINGS WITH M2 IN LOW POSITION
† MEASURED FROM OUTPUT OF M1

THE COOPERATION OF THE MANUFACTURER OF THIS EQUIPMENT MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

1. DC voltage measurements taken with vacuum tube voltmeter. AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.

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GENERAL ELECTRIC
MODELS 630, 631, 632

GENERAL ELECTRIC
MODELS 630, 631, 632

TRADE NAME	General Electric Models 630, 631, 632
MANUFACTURER	General Electric Co., Electronics Dept., Electronics Park, Syracuse, N.J.
TYPE SET	Three Power Portable AM Superheterodyne Receiver
TUBES (Four)	Types 1R5 Conv., 1U4 IF Amp., 1U5 Det.-AVC-AF Amp., 3V4 Output
POWER SUPPLY RATING	110-120 Volts AC-DC (or) 1.5 Volts "A" Supply & 67.5 Volts "B" Supply .11 Amp. @ 117 Volts AC (or) 200MA @ 1.5 Volts DC & 6MA @ 67.5 Volts DC
TUNING RANGE—BROADCAST	540KC - 1600KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.
Loop should be maintained in same relative position to chassis as when receiver is in cabinet.
Use battery power, if possible. If AC power is used, use an isolation transformer when available. If not, connect a .1MFD capacitor in series with low side of the signal generator and B-.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.1MFD	High side to pin 6 (grid) of 1R5 (V1). Low side to B-.	455KC (400~Mod)	Tuning gang fully open	Across voice coil	A1, A2, A3, A4	Adjust for maximum output. If AC power is used without an isolation transformer, reduce dummy antenna to 200MMF to reduce hum modulation.
2.	"	"	1620KC	"	"	A5	"
3.		Loop	1400KC	Rock tuning gang	"	A6	Adjust for maximum output. Repeat steps 2 and 3.

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PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA, GENERAL ELECTRIC, WESTINGHOUSE)

ITEM No.	USE	REPLACEMENT DATA		RETMA BASE TYPE	NOTES
		General Electric PART No.	STANDARD REPLACEMENT		
V1	Converter	1R5	1R5	7AT	
V2	IF Amp.	1U4	1U4	6AR	
V3	Det-AVC-AF Amp.	1U5	1U5	6BW	
V4	Output	3V4	3V4	6BX	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	General Elec. PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C1A	■60	150	RCE-151	PRS106D50A					R1465	
B	▲40	150								
C	200	20								
C2	022	200	RCC-123	P288-022		PJ2S22		PT4122	2TM-S22	
C3	2.2		RCN-039	SI2.2NP0	TCN-2.2	TZ05	NP0K-2R2		5TCCB-V22	
C4	47		RCW-3075							
C5	5000		RCW-3014	BPD-005	DD-502	K080	801-005	DC-525	5HK-D5	
C6	.33	100	RCN-070							
C7	2.2		RCN-039	SI2.2NP0	TCN-2.2	TZ05	NP0K-2R2		5TCCB-V22	
C8	3000		RCW-3118	BPD-003	DD-302	K076	801-003	DC-523	5HK-D3	
C9	220		RCW-3126	SI220	D6-221	TP39	GP1K-221	UC-5322	5GA-T22	
C10A	2000		*RCW-3089	*PA-285	DD-202	K072	801-002	DC-522	5HK-D2	
B	220				D6-221	TP39	GP1K-221	VC-5322	5GA-T22	
C	5000				DD-502	K080	801-005	DC-525	5HK-D5	
D	4000				DD-402	K079	801-004	DC-524	5HK-D4	
C11	2000		RCW-3018	BPD-002	DD-202	K072	801-002	DC-522	5HK-D2	
C12	.047	600	RCN-053	689ZX-047	DF-503	PJ6S47		PT6147	6TM-S47	
C13	.047	400	RCC-125	P488-048	DF-503	CUB4S47		PT4147	4TM-S47	

* Items C10A, C10B, C10C, C10D are combined in one unit.

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	General Elec. PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	
R1A	1Meg	½	RRC-253	Q13-137	A47-1Meg-Z	BSK-70-S	U-53	Volume
B	Shaft		Not Req.	Not Req.	KSS-3	Not Req.	Not Req.	Attach to R1A
C	Switch		Not Req.	76-2	SWE-20	Not Req.	US-27	Attach to R1A

RESISTORS

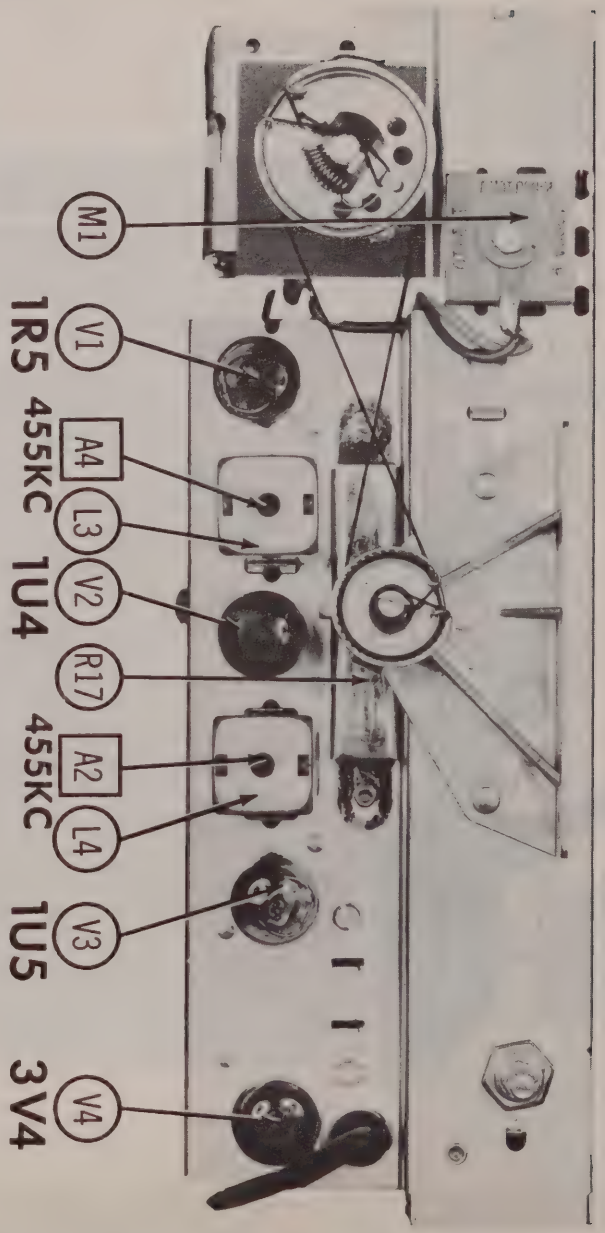
ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	General Electric PART No.	IRC PART No.	
R2	100KΩ	½	URD-097	BTS-100K	
R3	10KΩ	½	URD-073	BTS-10K	
R4	6.8Meg	½	URD-141	BTS-6.8Meg	
R5	3.3Meg	½	URD-133	BTS-3.3Meg	
R6	3.3Meg	½	URD-133	BTS-3.3Meg	
R7	10Meg	½	URD-145	BTS-10Meg	
R8	3.3Meg	½	URD-133	BTS-3.3Meg	
R9	470KΩ	½	URD-113	BTS-470K	
R10	3.3Meg	½	URD-133	BTS-3.3Meg	

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	General Electric PART No.	IRC PART No.	
R11	33KΩ	½	URD-085	BTS-33K	
R12	470Ω	½	URD-041	BTS-470	
R13	1500Ω	½	URD-053	BTS-1500	
R14	1500Ω	½	URD-053	BTS-1500	
R15	180Ω	½	URD-031	BTS-180	
R16	2700Ω	1	URE-059	BTA-2700	
R17	2300Ω	10	RRW-042		
R18	100Ω	2	URF-025		

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	General Electric PART No.	Stancor PART No.	Merit PART No.	Triad PART No.	Halldorson PART No.	Thordarson PART No.	
T1	9,8KΩ	3.6Ω	RT0-133	A-3329	A-2998	S-8X	Z1110	24S49	

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

SPEAKER

ITEM No.	RATINGS			REPLACEMENT DATA			NOTES
	SIZE	FIELD	V. C. IMP.	General Electric PART No.	JENSEN PART No.	QUAM PART No.	
SP1	4"	PM	3.6Ω	S-400-4 S-400-7 ①	ST-113 Mod. P4-X	4A07	① Alternate speaker

COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA				NOTES
		PRI.	SEC.	General Elec. PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L1	Ant. Coil	.4Ω		RLL-059				
L2	Osc. Coil	7Ω	1.9Ω	RLC-101	14-1074*	BC-381■	70-Osc.*	
L3	Input IF	25Ω	25Ω	RTL-156	16-6758	BC-352	12-C1	
L4	Output IF	25Ω	25Ω	RTL-156	16-6758	BC-353	12-C2	

* Leads sufficient mounting support
■ Drill mounting hole

SELENIUM RECTIFIER

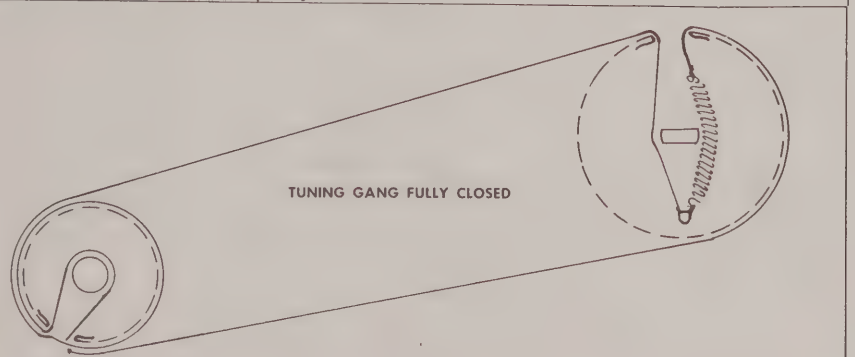
ITEM No.	RATING	REPLACEMENT DATA						NOTES
	CURRENT	General Electric PART No.	FEDERAL PART No.	INTERNATIONAL PART No.	MALLORY PART No.	SARKES TARZIAN PART No.	SELETRON PART No.	
M1	.059ADC	REX-005	1003A	RS65	6S75	75	5M4	

BATTERIES

ITEM No.	VOLTAGE	General Electric PART No.	REPLACEMENT DATA						INSTALLATION NOTES
			EVEREADY			BURGESS			
			"A"	"B"	"A-B"	"A"	"B"	"A-B"	
M2	1.5V		964			21R			Connect 2 in parallel.
M3	67.5V			467			XX45		

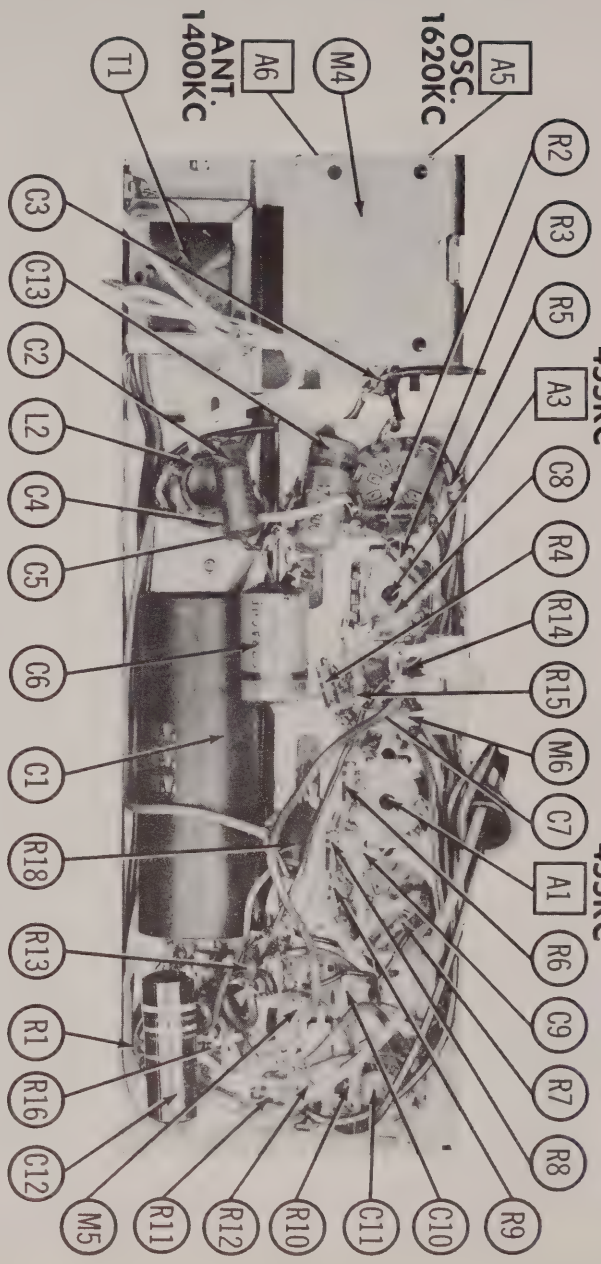
MISCELLANEOUS

ITEM No.	PART NAME	General Electric PART No.	NOTES
M4	Tuning Cap.	RCT-077	19-300MMF, 18-145MMF
M5	Switch	RSW-103	AC-DC - Battery Selector
M6	Switch	RSW-008	Battery Saver
	Cabinet	RAU-407	Green - Model 630
	Cabinet	RAU-408	Red - Model 631
	Cabinet	RAU-409	Grey - Model 632
	Knob	RDK-387	Volume - Gray - Model 632
	Knob	RDK-397	Tuning - Gray - Model 632 (with dial scale)
	Knob	RDK-398	Tuning - Green - Model 630 (with dial scale)
	Knob	RDK-399	Tuning - Red - Model 631 (with dial scale)
	Knob	RDK-400	Volume - Green - Model 630
	Knob	RDK-401	Volume - Red - Model 631
	Handle	RHV-057	Green - Model 630
	Handle	RHV-058	Red - Model 631
	Handle	RHV-059	Gray - Model 632



DIAL CORD STRINGING

CHASSIS—BOTTOM VIEW



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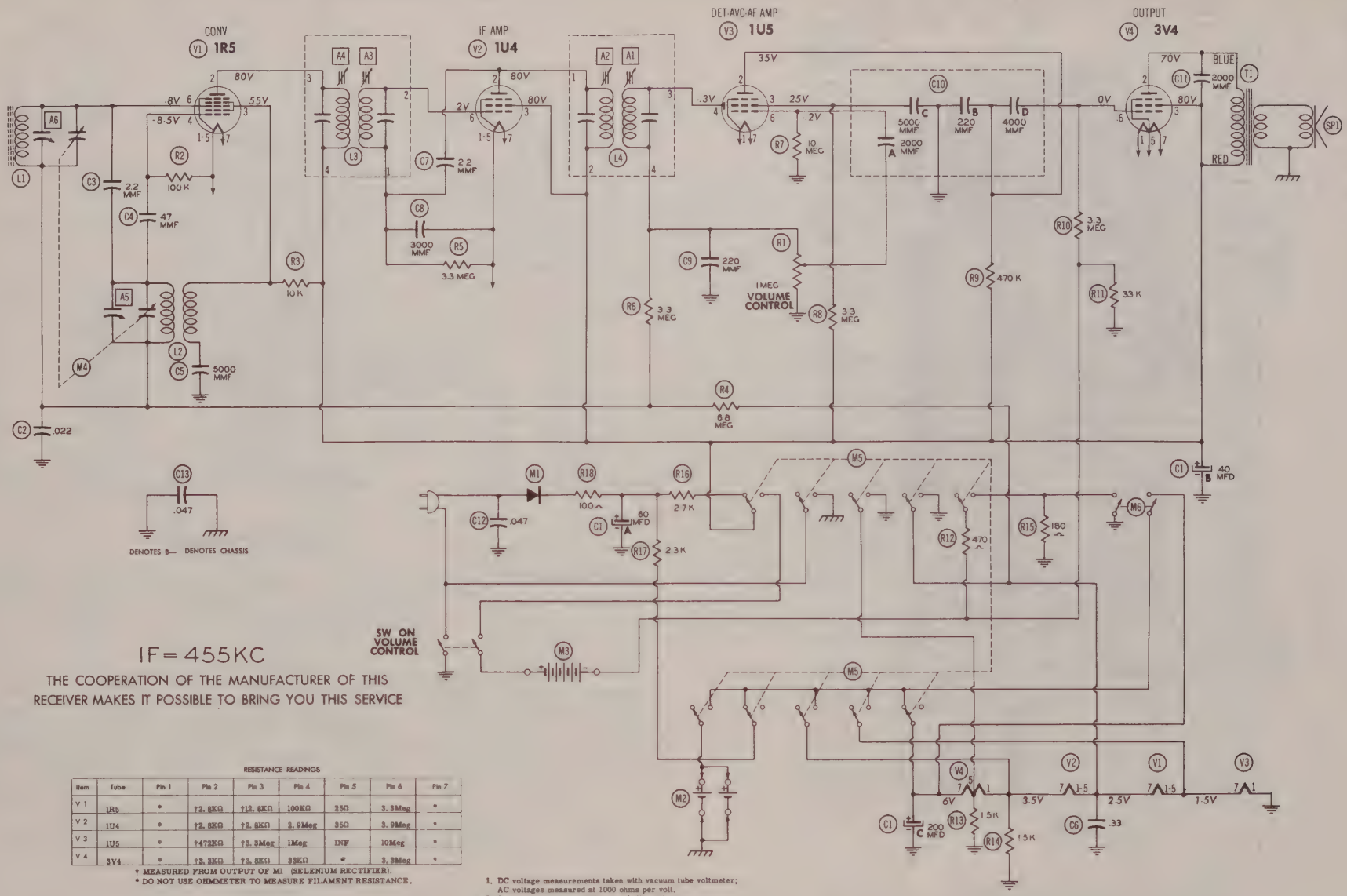

IF = 455KC

THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V 1	1R5	*	†2. 8KΩ	†2. 8KΩ	100KΩ	25Ω	3. 3Meg	*
V 2	1U4	*	†2. 8KΩ	†2. 8KΩ	2. 9Meg	35Ω	3. 9Meg	*
V 3	1U5	*	†472KΩ	†3. 3Meg	1Meg	DNF	10Meg	*
V 4	3V4	*	†3. 3KΩ	†3. 8KΩ	35KΩ	∞	3. 3Meg	*

† MEASURED FROM OUTPUT OF M1 (SELENIUM RECTIFIER).
* DO NOT USE OHMMETER TO MEASURE FILAMENT RESISTANCE.

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

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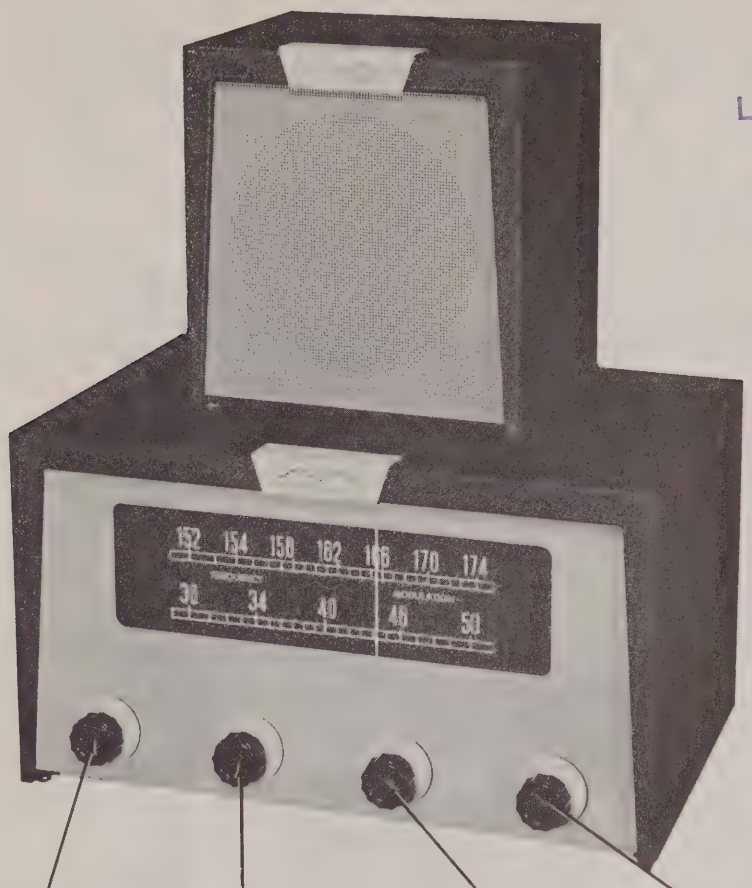
MONITORADIO
MODELS DR-200, DRS-1



MONITORADIO
MODELS DR-200, DRS-1

TRADE NAME	Monitoradio Models DR-200 (Receiver), DRS-1 (Speaker)		
MANUFACTURER	Radio Apparatus Corp., 55 N. New Jersey, Indianapolis, Indiana		
TYPE SET	AC Operated FM Superheterodyne Receiver		
TUBES	Fifteen		
POWER SUPPLY	105-125 Volts AC-60 Cycles	RATING	.69 Amp. @ 117 Volts AC
TUNING RANGE	(Low Band) 30-50MC, (High Band) 152-174MC		

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"The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed."
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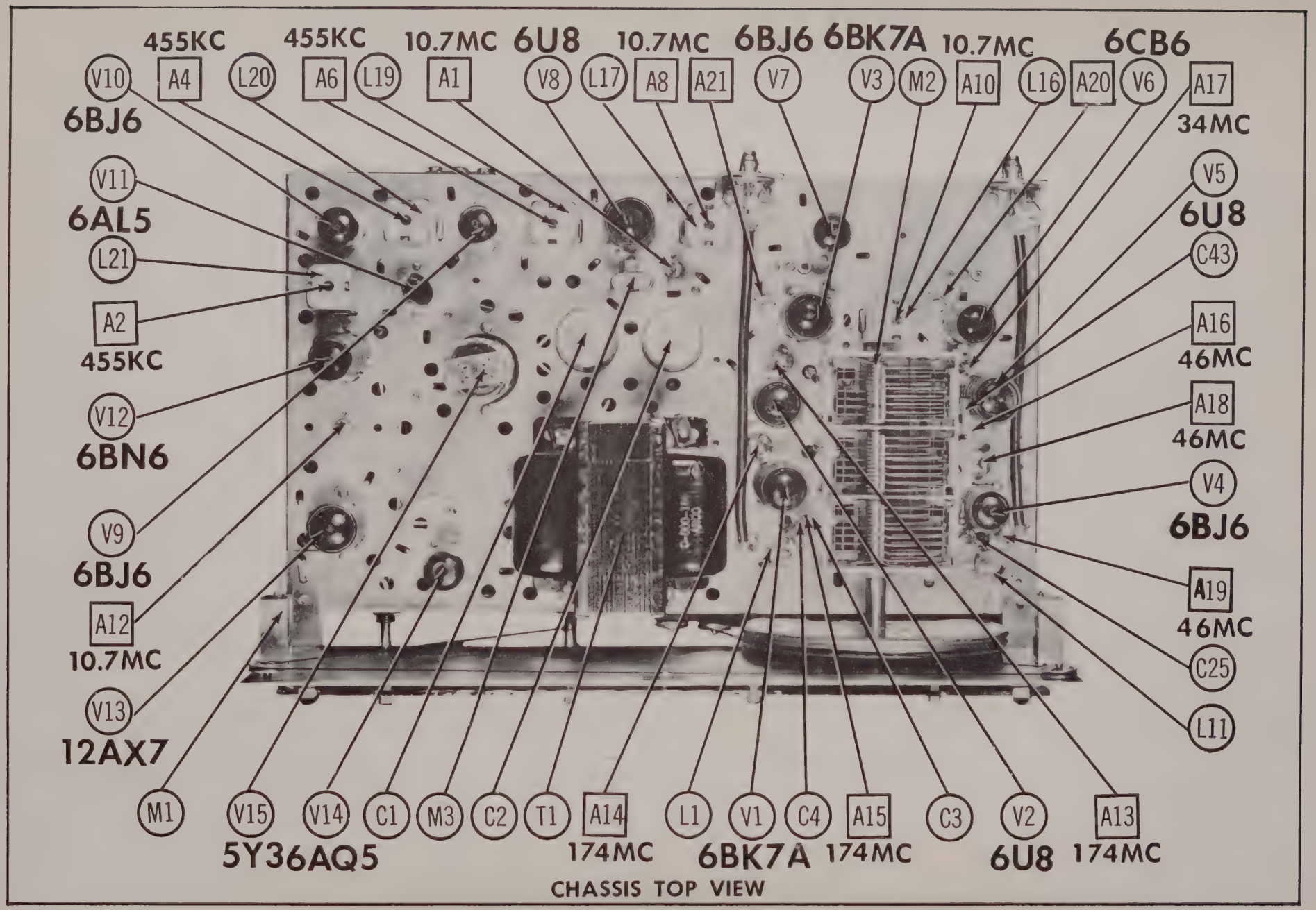
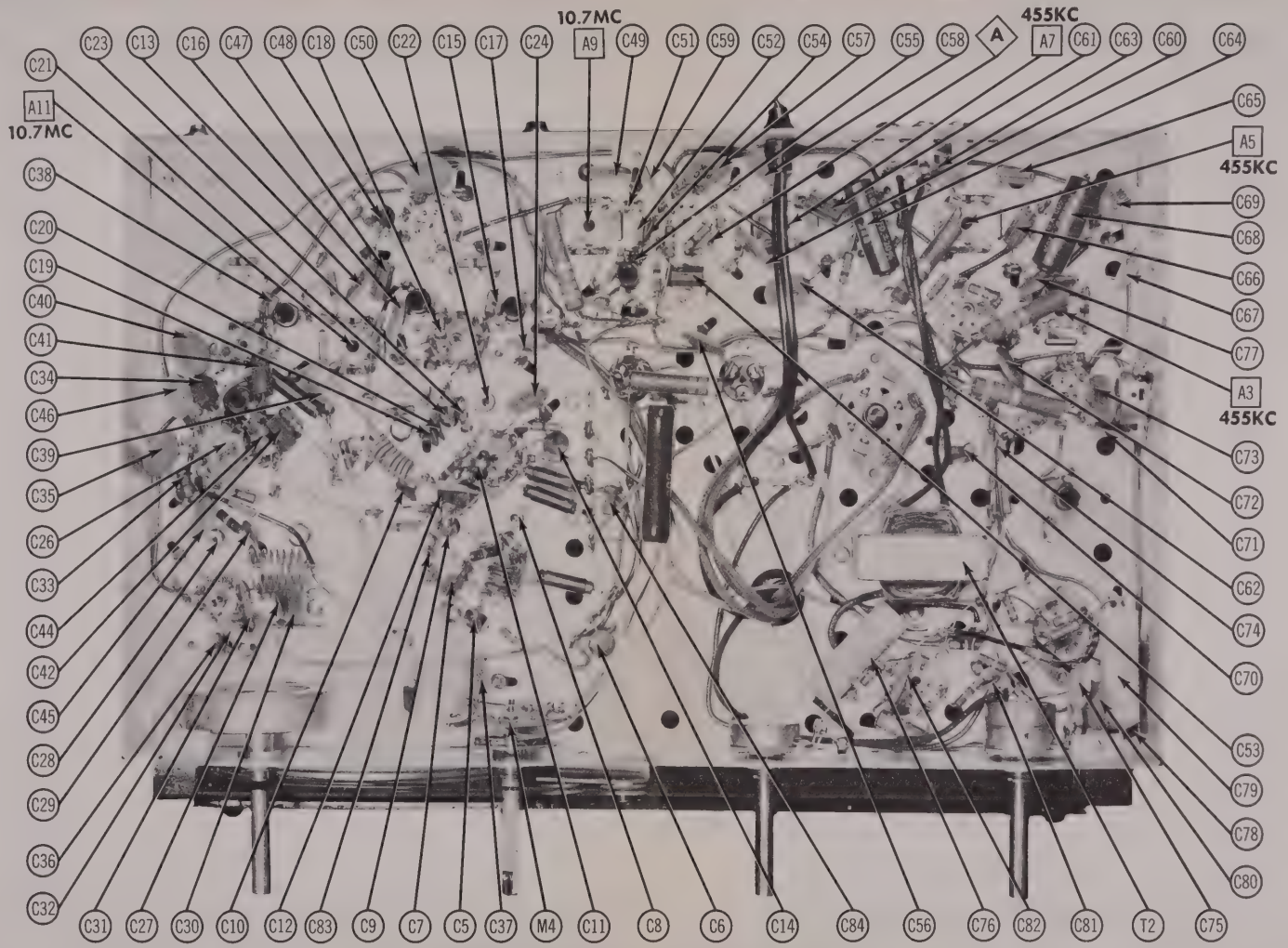


CHASSIS TOP VIEW



CHASSIS BOTTOM VIEW-CAPACITOR IDENTIFICATION

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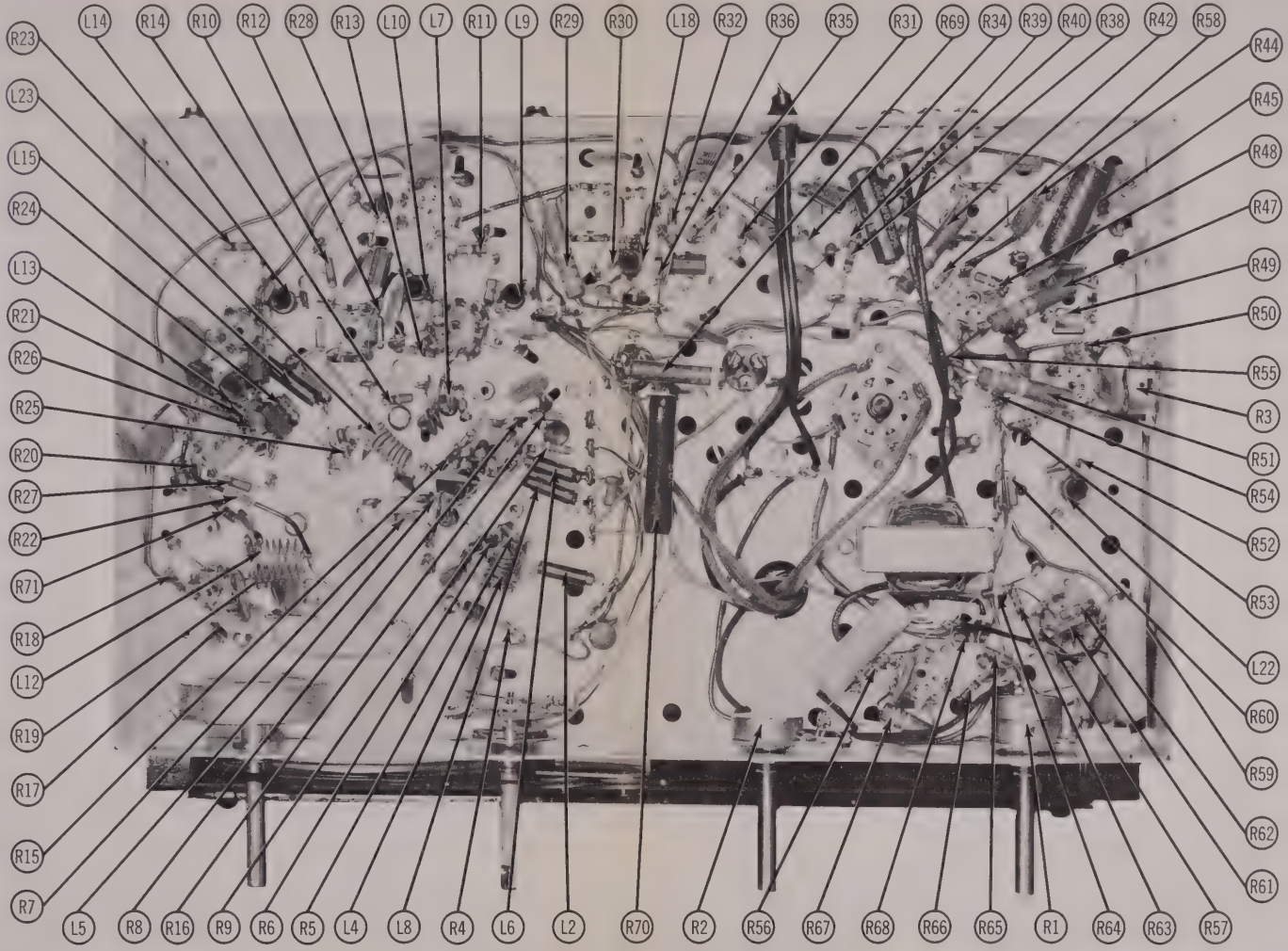
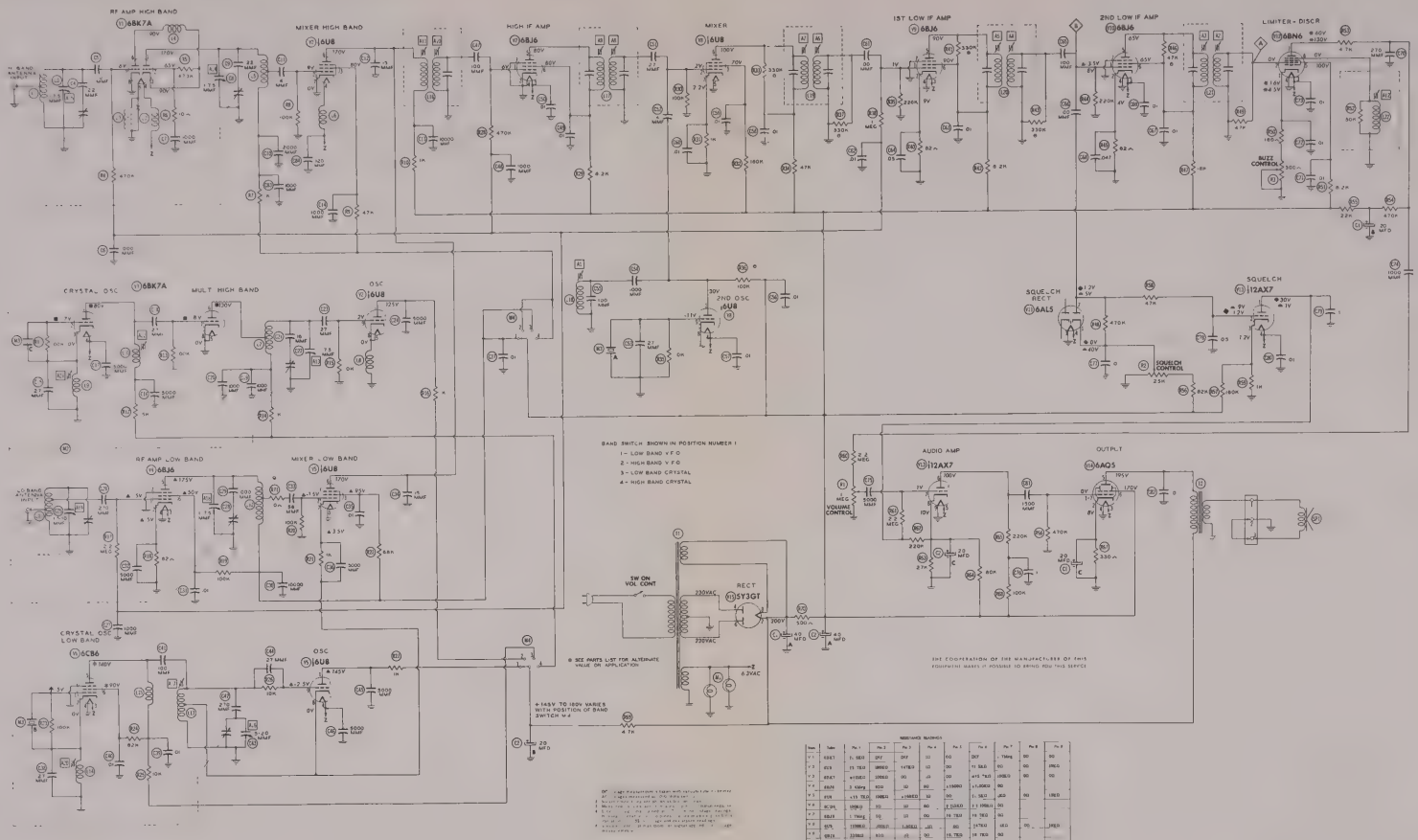


CHASSIS BOTTOM VIEW-RESISTOR IDENTIFICATION



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261-8

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ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Unless it has been definitely established that the alignment of the IF has been disturbed, the receiver should not be realigned, as it has been properly aligned at the factory for optimum performance.
The following procedure is intended for realignment of the receiver. Under normal conditions the receiver will not require a complete realignment.
The following equipment is used during alignment.

1. A non-metallic alignment tool with blade dimensions of approximately 1/16" x 1/8".
2. A non-metallic alignment tool with a hexagon end approximately 1/10" across flats.
3. An alignment tool with a steel tip approximately 1/64" thick.
4. A vacuum tube voltmeter.
5. FM sweep generator with marker.
6. A Measurements Corp. Model 80 signal generator or equivalent.
7. A cathode ray oscilloscope.
8. A detector as shown in Figure 1.

SECOND OSCILLATOR ALIGNMENT

Connect DC probe of VTVM to pin 9 of 6U8 (V8). Common lead to chassis.
Adjust L12 slug, A1, for maximum deflection on VTVM. Note the maximum reading and turn the iron core COUNTERCLOCKWISE until the voltmeter reads 80 percent of maximum value; this decrease will provide optimum oscillator stability.
The voltage at the VTVM will be approximately 1.1 volts.

IF ALIGNMENT

Connect the synchronized sweep voltage from the signal generator to the horizontal input of the oscilloscope for horizontal deflection.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	SCOPE CONNECT	ADJUST	REMARKS
1.	.001MFD	High side to pin 2 (grid) of 6U8 (V2). Low side to chassis.	10.7MC (80KC Swp)	High VFO	Point of non-interference.	Vert. Amp. thru detector (Fig. 1) to point (A).	A2, A3, A4, A5, A6, A7	Set marker to 10.7MC. Use hex alignment tool and adjust for maximum output on scope, centered at about 10.7MC. When adjusting the secondary slug of transformer, shunt the primary winding with a 1000Ω carbon resistor. When adjusting the primary winding, shunt the secondary winding in the same manner. Attenuate generator to avoid distortion of response curve.
2.	"	"	"	"	"	"	A8, A9 A10, A11	Use 1/16" x 1/8" blade alignment tool. Adjust for maximum symmetrical output as in Fig. 2. Do not shunt the transformer windings as in step 1.
3.	"	"	"	"	"	Vert. Amp. to top of Vol. Control R1. Low side to chassis.	A12	Adjust so that 10.7MC marker is centered in straight line portion of trace as in Fig. 3. Use the thin tip alignment screwdriver.
4.	Repeat SECOND OSCILLATOR ALIGNMENT.							

RF ALIGNMENT-HIGH BAND

Use thin tip screwdriver for trimmer adjustments.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	VTVM CONNECT	ADJUST	REMARKS
5.	22Ω Carbon Resistor	Across HIGH BAND antenna terminals with 22Ω resistor in high lead. Use very short leads.	174MC (Unmod)	High VFO	174MC	DC Probe to point (B). Common to chassis.	A13	Set generator for minimum usable output. Adjust A13 for maximum deflection.
6.	"	"	152MC	"	152MC	"	L6	Compress or expand coil turns for maximum deflection.
7.	Repeat steps 5 and 6 until no further improvement is noted.							
8.	22Ω Carbon Resistor	Across HIGH BAND antenna terminals with 22Ω resistor in high lead. Use very short leads.	174MC	High VFO	174MC	DC Probe to point (B). Common to chassis.	A14, A15	Adjust for maximum deflection.
9.	"	"	152MC	"	152MC	"	L3, L1	Compress or expand coil turns for maximum deflection.
10.	Repeat steps 8 and 9 until no further improvement is noted.							

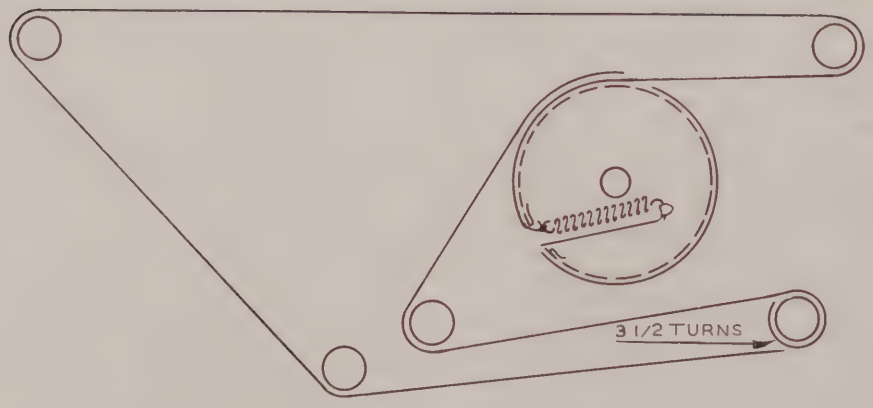
RF ALIGNMENT-LOW BAND

Use thin tip screwdriver for trimmer and slug adjustments.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	VTVM CONNECT	ADJUST	REMARKS
11.	22Ω Carbon Resistor	Across LOW BAND antenna input with 22Ω resistor in high lead. Use very short leads.	46MC (Unmod)	Low VFO	46MC	DC Probe to point (B). Common to chassis.	A16	Set generator for minimum usable output. Adjust A16 for maximum deflection.
12.	"	"	34MC	"	34MC	"	A17	Adjust for maximum deflection.

ALIGNMENT INSTRUCTIONS (cont)

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	VTVM CONNECT	ADJUST	REMARKS
13.	Repeat steps 11 and 12 until no further improvement is noted.							
14.	22Ω Carbon Resistor	Across LOW BAND antenna input with 22Ω resistor in high lead. Use very short leads.	46MC	Low VFO	46MC	DC Probe to point (B). Common to chassis.	A18, A19	Adjust for maximum deflection.
15.	"	"	34MC	"	34MC	"	L7, L8	Compress or expand coil turns for maximum deflection.
16.	Repeat steps 14 and 15 until no further improvement is noted.							
17.	22Ω Carbon Resistor	Across LOW BAND antenna input with 22Ω resistor in high lead. Use very short leads.	34MC (30% AM)	Low VFO	34MC	Not used	R50	Use approximately 2 micro-volts input signal. Adjust for minimum audio output.



DIAL CORD STRINGING

PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA, GENERAL ELECTRIC, WESTINGHOUSE)

ITEM No.	USE	REPLACEMENT DATA		RETMA BASE TYPE	NOTES
		Monitoradio PART No.	STANDARD REPLACEMENT		
V1	RF Amp. High Band	6BK7A	6BK7A	9AJ	
V2	Mixer High Band-Oscillator	6U8	6U8	9AE	
V3	Crystal Osc. Mult. High Band	6BK7A	6BK7A	9AJ	
V4	RF Amp. Low Band	6BJ6	6BJ6	7CM	
V5	Mixer Low Band-Oscillator	6U8	6U8	9AE	
V6	Xtal Osc. Low Band	6CB6	6CB6	7CM	
V7	High IF Amp.	6BJ6	6BJ6	7CM	
V8	Mixer-2nd. Oscillator	6U8	6U8	9AE	
V9	1st. Low IF Amp.	6BJ6	6BJ6	7CM	
V10	2nd. Low IF Amp.	6BJ6	6BJ6	7CM	
V11	Squelch Rectifier	6AL5	6AL5	6BT	
V12	Limiter-Discrim.	6BN6	6BN6	7DF	
V13	Squelch-AF Amplifier	12AX7	12AX7	9A	
V14	Audio Output	6AQ5	6AQ5	7BZ	
V15	Rectifier	5Y3GT	5Y3GT	5T	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA Monitoradio PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C1A	■40	250	300-082-8	AFH3-20		C016		FP345.8	TVL-3540	
B	▲20	250						TC55		
C	20	25								
C2A	■40	250						FP345.8		
B	▲20	250	300-082-8	AFH3-20		C016		TC55	TVL-3540	
C	20	25								
C3	1-7.5		X1545-003							
C4	22		100-203-5		TCN-22				5TCU-Q22	
C5	10			SI10NP0	TCZ-10		N750K-100	ZT-541	5TCC-Q1	
C6	1000			BPD-001	DD-102	TM5D1	812-001	DC-521	5HK-D1	
C7	1000			BPD-001	DD-102	TM5D1	812-001	DC-521	5HK-D1	
C8	1-7.5		X1545-003							
C9	22		100-203-5		TCN-22				5TCU-Q22	
C10	1000			BPD-001	DD-102	TM5D1	812-001	DC-521	5HK-D1	
C11	14		100-203-3							
C12	15		35-006-150							
C13	10000			BPD-01	DD-103	TM5S1	811	DC-511	5HK-S1	
C14	1000			BPD-001	DD-102	TM5D1	812-001	DC-521	5HK-D1	
C15	27		35-006-270							
C16	5000			BPD-005	DD-502	TM5D5	812-005	DC-525	5HK-D5	
C17	5000			BPD-005	DD-502	TM5D5	812-005	DC-525	5HK-D5	
C18	27		100-203-2		TCN-27					
C19	1000			BPD-001	DD-102	TM5D1	812-001	DC-521	5HK-D1	
C20	1000			BPD-001	DD-102	TM5D1	812-001	DC-521	5HK-D1	
C21	18		100-203-4	SI18	D6-180		GP1K-180	UC-5418	5GA-Q18	
C22	1-7.5		X1545-003							
C23	27		100-203-2		TCN-27					
C24	5000			BPD-005	DD-502	TM5D5	812-005	DC-525	5HK-D5	
C25	1.5-10		X1545-002							
C26	270			SI270	D6-271		GP2K-271	UC-5327	5GA-T27	
C27	1000			BPD-001	DD-102	TM5D1	812-001	DC-521	5HK-D1	
C28	1.5-10		X1545-002							
C29	1000			BPD-001	DD-102	TM5D1	812-001	DC-521	5HK-D1	
C30	10000			BPD-01	DD-103	TM5S1	811-01	DC-511	5HK-S1	
C31	10000			BPD-001	DD-102	TM5D1	812-001	DC-521	5HK-D1	
C32	5000			BPD-005	DD-502	TM5D5	812-005	DC-525	5HK-D5	
C33	56			SI56	D6-560		GP1K-560	UC-5456	5GA-Q56	
C34	15	500	35-006-150						MS-415	
C35	10000			BPD-01	DD-103	TM5S1	811-01	DC-511	5HK-S1	

PARTS LIST AND DESCRIPTIONS (Continued)

CAPACITORS (cont)

ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA MONITORADIO PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C36	5000			BPD-005	DD-502	TM5D5	812-005	DC-525	5HK-D5	
C37	10000			BPD-01	DD-103	TM5S1	811-01	DC-511	5HK-S1	
C38	27	500	35-006-270							
C39	10000			BPD-01	DD-103	TM5S1	811-01	DC-511	5HK-S1	
C40	10000			BPD-01	DD-103	TM5S1	811-01	DC-511	5HK-S1	
C41	100	500	35-006-101	1469-0001		5R5T1		MCE235	MS-31	
C42	270	500	35-006-271							
C43	5-20		820-B							
C44	27		100-203-2		TCN-27					
C45	5000			BPD-005	DD-502	TM5D5	812-005	DC-525	5HK-D5	
C46	5000			BPD-005	DD-502	TM5D5	812-005	DC-525	5HK-D5	
C47	100	500	35-006-101	1469-0001		5R5T1		MCE235	MS-31	
C48	1500			BPD-0015	DD-152	TM5D15	812-0015	DC-5215	5HK-D15	
C49	10000			BPD-01	DD-103	TM5S1	811-01	DC-511	5HK-S1	
C50	10000			BPD-01	DD-103	TM5S1	811-01	DC-511	5HK-S1	
C51	27		100-203-2		TCN-27					
C52	4		QC-3.9							
C53	27		35-006-270							
C54	1000			BPD-001	DD-102	TM5D1	812-001	DC-521	5HK-D1	
C55	100	500	35-006-101	1469-0001		5R5T1		MCE235	MS-31	
C56	10000			BPD-01	DD-103	TM5S1	811-01	DC-511	5HK-S1	
C57	10000			BPD-01	DD-103	TM5S1	811-01	DC-511	5HK-S1	
C58	10000			BPD-01	DD-103	TM5S1	811-01	DC-511	5HK-S1	
C59	10000			BPD-01	DD-103	TM5S1	811-01	DC-511	5HK-S1	
C60	10000			BPD-01	DD-103	TM5S1	811-01	DC-511	5HK-S1	
C61	100	500	35-006-101	1469-0001		5R5T1		MCE235	MS-31	
C62	10000			BPD-01	DD-103	TM5S1	811-01	DC-511	5HK-S1	
C63	10000			BPD-01	DD-103	TM5S1	811-01	DC-511	5HK-S1	
C64	.05	200	35-001-504	P288-05	DF-503	PJ2S5		PT415	2TM-S5	
C65	100	500	35-006-101	1469-0001		5R5T1		MCE235	MS-31	
C66	100	500	35-006-101	1469-0001		5R5T1		MCE235	MS-31	
C67	10000			BPD-01	DD-103	TM5S1	811-01	DC-511	5HK-S1	
C68	.047	200	35-001-504	P288-05	DF-503	PJ2S5		PT415	2TM-S5	
C69	10000			BPD-01	DD-103	TM5S1	811-01	DC-511	5HK-S1	
C70	270			SI270	D6-271		GP1K-271	UC-5327	5GA-T27	
C71	10000			BPD-01	DD-103	TM5S1	811-01	DC-511	5HK-S1	
C72	10000			BPD-01	DD-103	TM5S1	811-01	DC-511	5HK-S1	
C73	10000			BPD-01	DD-103	TM5S1	811-01	DC-511	5HK-S1	
C74	1000			BPD-001	DD-102	TM5D1	812-001	DC-521	5HK-D1	
C75	5000			BPD-005	DD-502	TM5D5	812-005	DC-525	5HK-D5	
C76	.1	400	35-002-105	P488-1		PTE4P1		PT401	4TM-P1	
C77	10000			BPD-01	DD-103	TM5S1	811-01	DC-511	5HK-S1	
C78	.05	200	35-001-504	P288-05	DF-503	PJ2S5		PT415	2TM-S5	
C79	.1	400	35-002-105	P488-1		PTE4P1		PT401	4TM-P1	
C80	10000			BPD-01	DD-103	TM5S1	811-01	DC-511	5HK-S1	
C81	1500			BPD-0015	DD-152	TM5D15	812-0015	DC-5215	5HK-D15	
C82	10000			BPD-01	DD-103	TM5S1	811-01	DC-511	5HK-S1	
C83	1000			SI1000	D6-102	TM5D1	GP2K-102	UC-521	5GA-D1	
C84	120			SI120	D6-121		GP1K-121	UC-5412	5GA-T12	

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA Monitoradio PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	1Meg	1/2	300-268-1	Q13-137	AG-63-Z	B-70-S	U-53	Volume
B	Shaft		Not Req.	Not Req.	FS-3	Not Req.	Not Req.	Attach to R1A
C	Switch		Not Req.	76-1	SWB	Not Req.	US-26	Attach to R1A
R2A	25KΩ	1/2	300-268-2	Q14-120	AG-72-V	B-27	U-28	Squelch
B	Shaft		Not Req.	Not Req.	FS-3	Not Req.	Not Req.	Attach to R2A
R3	300Ω	1	100-456					Buzz wire wound

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PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS

ITEM No.	RATING OHMS	RATING WATT	REPLACEMENT DATA Monitoradio PART No.	REPLACEMENT DATA IRC PART No.	NOTES
R4	470KΩ	½	35-011-474	BTS-470K	
R5	470KΩ	½	35-011-474	BTS-470K	
R6	10Ω	½	35-011-100	BTS-10	
R7	1000Ω	½	35-011-102	BTS-1000	
R8	100KΩ	½	35-011-104	BTS-100K	
R9	47KΩ	½	35-008-473	BTS-47K	
R10	1000Ω	½	35-011-102	BTS-1000	
R11	100KΩ	½	35-011-104	BTS-100K	
R12	15KΩ	½		BTS-15K	Note 1
R13	100KΩ	½	35-011-104	BTS-100K	
R14	1000Ω	½	35-011-102	BTS-1000	
R15	10KΩ	½	35-011-103	BTS-10K	
R16	1000Ω	½	35-011-102	BTS-1000	
R17	2.2Meg	½	35-011-225	BTS-2.2Meg	
R18	82Ω	½	35-008-820	BTS-82	
R19	100KΩ	½	35-011-104	BTS-100K	
R20	100KΩ	½	35-011-104	BTS-100K	
R21	1000Ω	½	35-011-102	BTS-1000	
R22	68KΩ	½	35-011-683	BTS-68K	
R23	100KΩ	½	35-011-104	BTS-100K	
R24	82KΩ	½	35-008-823	BTS-82K	
R25	10KΩ	½	35-001-103	BTS-10K	
R26	10KΩ	½	35-001-103	BTS-10K	
R27	1000Ω	½	35-011-102	BTS-1000	
R28	470KΩ	½	35-011-474	BTS-470K	
R29	8200Ω	2	35-010-822	BTB-8200	
R30	100KΩ	½	35-011-104	BTS-100K	
R31	1000Ω	½	35-011-102	BTS-1000	
R32	180KΩ	½	35-008-184	BTS-180K	
R33	330KΩ	½	35-008-335	BTS-330K	Note 2
R34	47KΩ	½	35-008-473	BTS-47K	
R35	10KΩ	½	35-001-103	BTS-10K	
R36	100KΩ	½	35-011-102	BTS-100K	Note 3
R37	330KΩ	½	35-008-334	BTS-330K	Note 2
R38	1Meg	½	35-011-105	BTS-1Meg	
R39	220KΩ	½	35-011-224	BTS-220K	
R40	82Ω	½	35-008-820	BTS-82	
R41	330KΩ	½	35-008-334	BTS-330K	Note 2
R42	8200Ω	2	35-010-822	BTB-8200	
R43	330KΩ	½	35-008-334	BTS-330K	Note 2
R44	220KΩ	½	35-011-224	BTS-220K	
R45	82Ω	½	35-008-820	BTS-82	
R46	47KΩ	½	35-008-473	BTS-47K	Note 2
R47	18KΩ	2	35-010-183	BTB-18K	
R48	470KΩ	½	35-011-474	BTS-470K	
R49	47KΩ	½	35-008-473	BTS-47K	
R50	180Ω	½	35-008-181	BTS-180	
R51	8200Ω	2	35-010-822	BTB-8200	
R52	150KΩ	½	35-011-154	BTS-150K	
R53	4700Ω	½	35-011-472	BTS-4700	
R54	470KΩ	½	35-011-474	BTS-470K	
R55	22KΩ	½	35-011-223	BTS-22K	
R56	82KΩ	½	35-008-823	BTS-82K	
R57	180KΩ	½	35-008-184	BTS-180K	
R58	47KΩ	½	35-011-103	BTS-47K	
R59	1000Ω	½	35-011-102	BTS-1000	
R60	2.2Meg	½	35-011-225	BTS-2.2Meg	
R61	2.2Meg	½	35-011-225	BTS-2.2Meg	
R62	220KΩ	½	35-011-224	BTS-220K	
R63	27KΩ	½	35-008-273	BTS-27K	
R64	180KΩ	½	35-008-184	BTS-180K	
R65	220KΩ	½	35-001-224	BTS-220K	
R66	470KΩ	½	35-011-474	BTS-470K	
R67	330Ω	1	35-009-331	BTA-330	
R68	100K	½	35-011-104	BTS-100K	
R69	4700Ω	2	35-001-472	BTB-4700	
R70	500Ω	10	35-014-1	1 3/4A-500	
R71	10Ω	½		BTS-10	Note 2

Note 1. Some models may use a 1000Ω resistor in this application.
Note 2. Not used in all models.
Note 3. Some models may use a 180KΩ resistor in this application.

TRANSFORMER (POWER)

ITEM No.	RATING PRI.	RATING SEC. 1	RATING SEC. 2	RATING SEC. 3	REPLACEMENT DATA Monitoradio PART No.	Stancor PART No.	Merit PART No.	Triad PART No.	Halldorson PART No.	Thordarson PART No.
T1	117VAC @.69A	430VCT .097ADC	5VAC @ 2A	6.3VAC @4.8A	500-186 500-186-1 ①					

① Alternate power transformer.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	IMPEDANCE SEC.	REPLACEMENT DATA MONITORADIO PART No.	Stancor PART No.	Merit PART No.	Triad PART No.	Halldorson PART No.	Thordarson PART No.	NOTES
T2	5.2KΩ	3.6Ω	300-310-1	A-3877	A-2930	S-3X	Z1001	24551	

SPEAKER

ITEM No.	RATINGS SIZE	RATINGS FIELD	RATINGS V. C. IMP.	REPLACEMENT DATA Monitoradio PART No.	JENSEN PART No.	QUAM PART No.	NOTES
SP1	6"	PM	3.6Ω	500-185-1	ST-108 Mod. P6-X	6A1	

PARTS LIST AND DESCRIPTIONS (Continued)

COILS (RF-IF)

ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA Monitoradio PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	NOTES
L1	Ant. Coil	0Ω (tapped)		100-64				High Band (152-174MC)
L2	Fil. Choke	.1Ω		300-303-2	19-3001	TV-189	6175	1.3 Microhenries
L3	Fil. Choke	.1Ω		300-303-2	19-3001	TV-189	6175	Not used in all models.
L4	Neutr. Coil	0Ω		100-462				1.3 Microhenries High Band
L5	RF Coil	0Ω (tapped)		300-309-3				
L6	Fil. Choke	.1Ω		300-303-2	19-3001	TV-189	6175	1.3 Microhenries
L7	Osc. Coil	0Ω (tapped)		300-309-2				High Band (1st. Osc.)
L8	Fil. Choke	.1Ω		300-303-2	19-3001	TV-189	6175	1.3 Microhenries
L9	Crystal Osc. Cathode Coil	0Ω		300-309-3				High Band
L10	Crystal Osc.-Plate Coil	0Ω		300-308-1				High Band
L11	Ant. Coil	0Ω (tapped)		300-309-4				Low Band (30-50MC)
L12	RF Coil	0Ω (tapped)		300-309-1				Low Band (30-50MC)
L13	Osc. Coil	0Ω (tapped)		300-096-2				Low Band (1st. Osc.)
L14	Crystal Osc. Cathode Coil	0Ω		300-307-1				Low Band
L15	Crystal Osc. Plate Coil	.6Ω		300-303-1			4612	11.6 Microhenries
L16	1st. IF Trans.	.6Ω	.6Ω	300-077-1	16-3487	FM-254	1463	
L17	2nd. IF Trans.	.6Ω	.6Ω	300-077-2	16-3487	FM-254	1463	
L18	Osc. Coil	0Ω		300-307-2				2nd. Osc.
L19	3rd. IF Trans.	23Ω	23Ω	300-322-1	16-6758	BC-353	12-C2	
L20	4th. IF Trans.	23Ω	23Ω	300-322-1	16-6758	BC-353	12-C2	
L21	5th IF Trans.	13Ω	13Ω	300-322-2	16-6758	BC-353	12-C2	
L22	Quadrature Coil	80Ω		350-000				

MISCELLANEOUS

ITEM No.	PART NAME	Monitoradio PART No.	NOTES
M1	Dial Light		#47 Bayonet (2) used
M2	Tuning Cap.	300-311	6 Section and pulley
M3A	Crystal	300-304	10.245MC
B	Crystal	300-305	Low Band (specify freq.)
C	Crystal	300-306	High Band (specify freq.)
M4	Switch	100-461	Band Selector
	Cabinet	600-026	
	Back Cover	300-299	
	Dial Glass	500-184	
	Knob	500-195-1	Volume
	Knob	500-195-2	Squelch
	Knob	500-195-3	Tuning
	Knob	500-195-4	Band Selector

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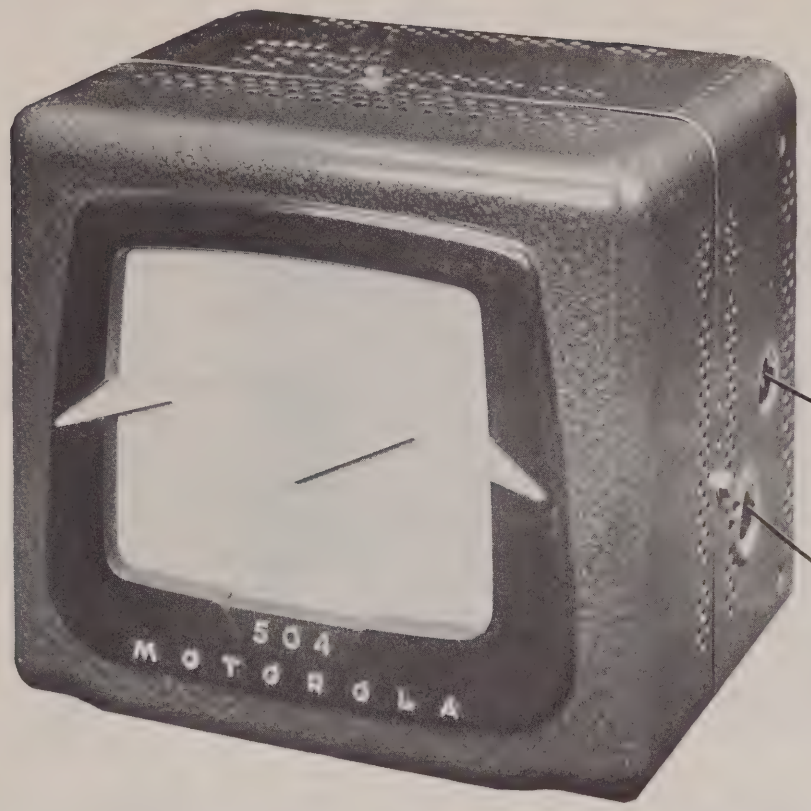

MOTOROLA
MODEL 504

TRADE NAME	Motorola Model 504
MANUFACTURER	Motorola Inc., 4545 Augusta Blvd., Chicago 51, Ill.
TYPE SET	Battery Operated Universal Automobile Superheterodyne Receiver
TUBES (Six)	Types 6BA6 RF Amp., 6BE6 Conv., 6BA6 IF Amp., 6CR6 Det-AVC-AF Amp., 6AQ5 Output, 6X4 Rectifier
POWER SUPPLY	6 Volt Storage Battery — RATING 5.4 Amp. @ 6.3 Volts DC
TUNING RANGE—BROADCAST	540-1605KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Attenuate generator output to maintain 1.8 volts on output meter. Use an insulated alignment screwdriver for adjusting.
Use Motorola alignment tool #66A76278 (or equivalent) for aligning tuning cores.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1	.1MFD	High side to pin 7 (grid) of 6BE6 (V2). Low side to chassis.	455KC (400~ Mod.)	High frequency end stop.	Across voice coil.	A1, A2 A3, A4	Adjust for maximum output.
2	Fig. 1	Thru dummy (fig. 1) to antenna receptacle.	1610KC	"	"	A5, A6 A7	If necessary, adjust tuner cores so that the cores project 1 1/8" from cans. Adjust A5, A6 and A7 in order given for maximum output.
3	"	"	1425KC	Tune to 1425KC signal.	"	A8, A9 A10	Adjust in order given for maximum output.
4	With radio installed in car and antenna fully extended tune to a weak station near 1400KC and adjust A7 for maximum volume. Adjustment may also be made for maximum noise between stations.						

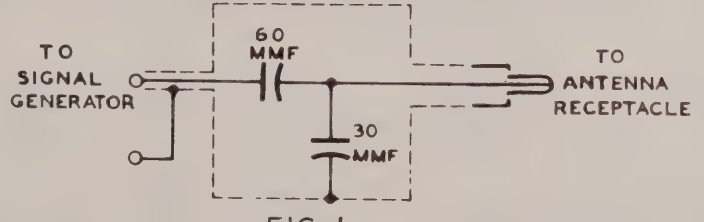

FIG. 1

HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

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PARTS LIST AND DESCRIPTIONS

MOTOROLA MODEL 504

TUBES (SYLVANIA, GENERAL ELECTRIC, WESTINGHOUSE)

ITEM No.	USE	REPLACEMENT DATA		RETMA BASE TYPE	NOTES
		MOTOROLA PART No.	STANDARD REPLACEMENT		
V1	RF Amp.	6BA6	6BA6	7BK	
V2	Converter	6BE6	6BE6	7CH	
V3	IF Amp.	6BA6	6BA6	7BK	
V4	Det-AVC-AF Amp.	6CR6	6CR6	7EA	
V5	Output	6AQ5	6AQ5	7BZ	
V6	Rectifier	6X4	6X4	5BS	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	MOTOROLA PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C1A	■30	350	23A531613	AFH3-108		C081		FP330. 7	TVL-3636	
B	▲10	350								
C	20	25								
C2	90		21A491682							
C3	. 006	400	8R121001	P688-006	D6-602	CUB6D6	GP2-333-602	PT626	6TM-D6	
C4	. 05	100	8R121005	P288-05	DF-503	PJ2S5		PT415	2TM-S5	
C5	5		21R115955	SI5	D6-050	TP06	GP1K-050	ZT-555	5GA-V5	
C6	47		21R6513							
C7	. 05	400	8R121567	P488-05	DF-503	CUB4S5		PT415	4TM-S5	
C8	. 01	400	8R121002	P488-01	D6-103	CUB4S1	GP2-333-103	PT411	4TM-S1	
C9	. 05	400	8R121567	P488-05	DF-503	CUB4S5		PT415	4TM-S5	
C10	470		21R114554	BPD-00047	D6-471	K060	GP1K-470	UC-5447	5GA-Q47	
C11	100		21R115639	SI100	D6-101	TP34	Gp1K-101	UC-531	5GA-T1	
C12	. 01	400	8R121002	P488-01	D6-103	CUB4S1	GP2-333-103	PT411	4TM-S1	
C13	. 01	400	8R121002	P488-01	D6-103	CUB4S1	GP2-333-103	PT411	4TM-S1	
C14	. 5	100	8K17028	VHC-36		PJ2P5		RF480	HC-2	
C15	. 5	100	8K17028	VHC-36		PJ2P5		RF480	HC-2	
C16	. 02	1000	8R121004	P1088-02		CUB16S2		PT1012	MB-S2	

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	MOTOROLA PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	
R1	250KΩ	½	18B531561					Volume & Switch - Note 1

Note 1: Some models may use an alternate control part no. 1K531614.

RESISTORS

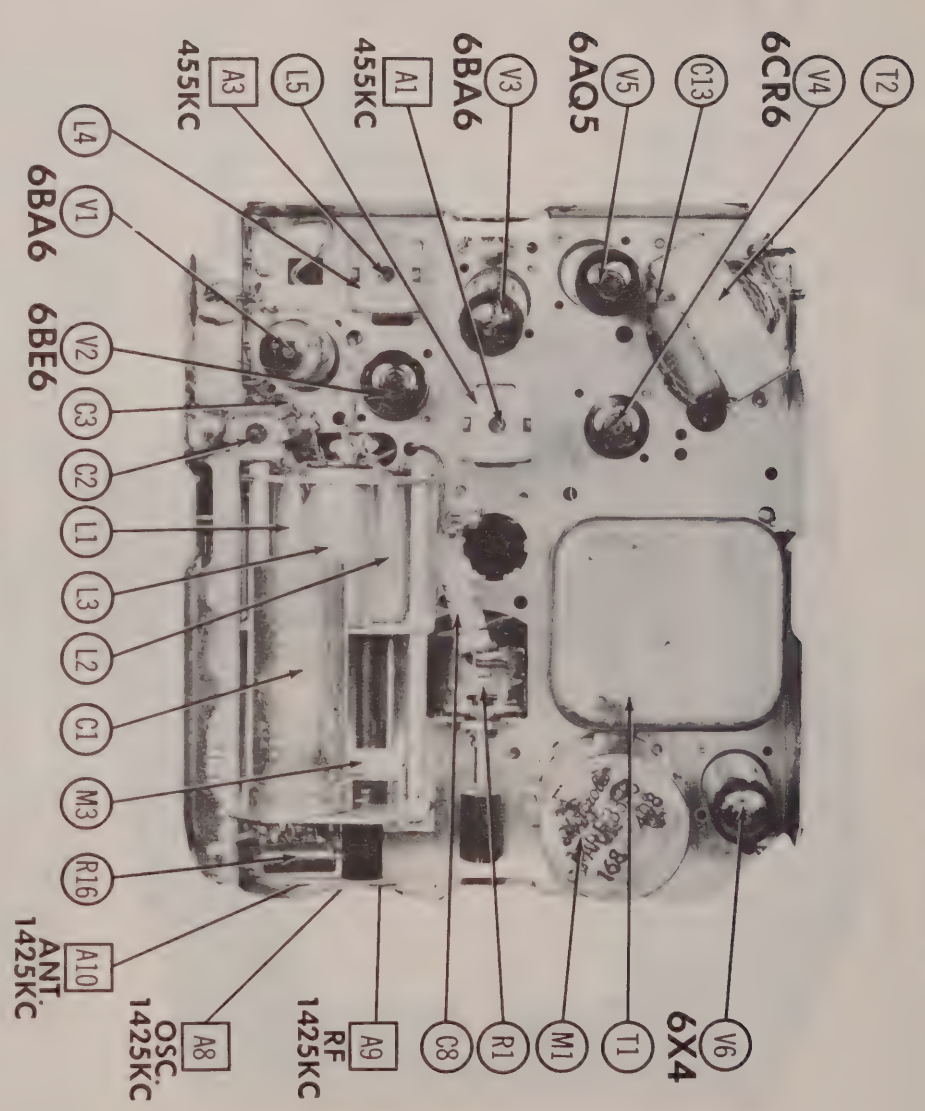
ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	MOTOROLA PART No.	IRC PART No.	
R2	470KΩ	½	6R6032	BTS-470K	
R3	150Ω	½	6R6373	BTS-150	
R4	100KΩ	½	6R6075	BTS-100K	
R5	47KΩ	½	6R6056	BTS-47K	
R6	330Ω	½	6R6022	BTS-330	
R7	6800Ω	2	6R5690	BTB-6800	
R8	1Meg	½	6R6004	BTS-1Meg	
R9	2. 2Meg	½	6R3927	BTS-2. 2Meg	

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	MOTOROLA PART No.	IRC PART No.	
R10	1Meg	½	6R6004	BTS-1Meg	
R11	220KΩ	½	6R6015	BTS-220K	
R12	1Meg	½	6R6004	BTS-1Meg	
R13	1Meg	½	6R6004	BTS-1Meg	
R14	270KΩ	½	6R6414	BTS-270K	
R15	270Ω	½	6R6432	BTS-270	
R16	2200Ω	2	6R476130	BTB-2200	
R17	56Ω	1	6R2037		
R18	56Ω	1	6R2037		

TRANSFORMER (VIBRATOR)

ITEM No.	RATING				REPLACEMENT DATA					
	PRI.	SEC. 1	SEC. 2	SEC. 3	MOTOROLA PART No.	Stancor PART No.	Merit PART No.	Triad PART No.	Halldorson PART No.	Thordarson PART No.
T1	6. 3VCT @ 3. 3A	416VCT . 049ADC			25C472533-J	P-6471				

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	IMPEDANCE SEC.	REPLACEMENT DATA MOTOROLA PART No.	Stancor PART No.	Merit PART No.	Triad PART No.	Halldorson PART No.	Thordarson PART No.	NOTES
T2	5.2KΩ	3.2Ω	25B70171-N	A-3877	A-2930	S-3X	Z1004	24S51	

SPEAKER

ITEM No.	RATINGS SIZE	FIELD	V. C. IMP.	REPLACEMENT DATA MOTOROLA PART No.	JENSEN PART No.	QUAM PART No.	NOTES
SP1	5 1/4"	PM	3.2Ω	50K521882	ST-803 Mod. P525-V	52A1	

COILS (RF-IF)

ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA MOTOROLA PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	NOTES
L1	Ant. Coil	12Ω		24B71881				Part of complete unit.
L2	RF Coil	12Ω		24B71881				
L3	Osc. Coil	.7Ω	3.6Ω	24B592153				
L4	Input IF	17Ω	17Ω	24C485553	16-6758	BC-352	12-C1	
L5	Output IF	17Ω	17Ω	24C485554	16-6770	BC-355	12-C6	
L6	Fil. Choke	0Ω		24K78026				1.1 Microhenries
L7	Fil. Choke	0Ω		24K521084				1.1 Microhenries
L8	Vib. Hash Choke	0Ω		24A472535		BC-537	5221	15.2 Microhenries

VIBRATOR

ITEM No.	TYPE	INPUT VOLTS	FREQUENCY	REPLACEMENT DATA MOTOROLA PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	RADIART PART No.	NOTES
M1	Interupter	6.3V	115∿	48B3333	5342	859	5342	

FUSES

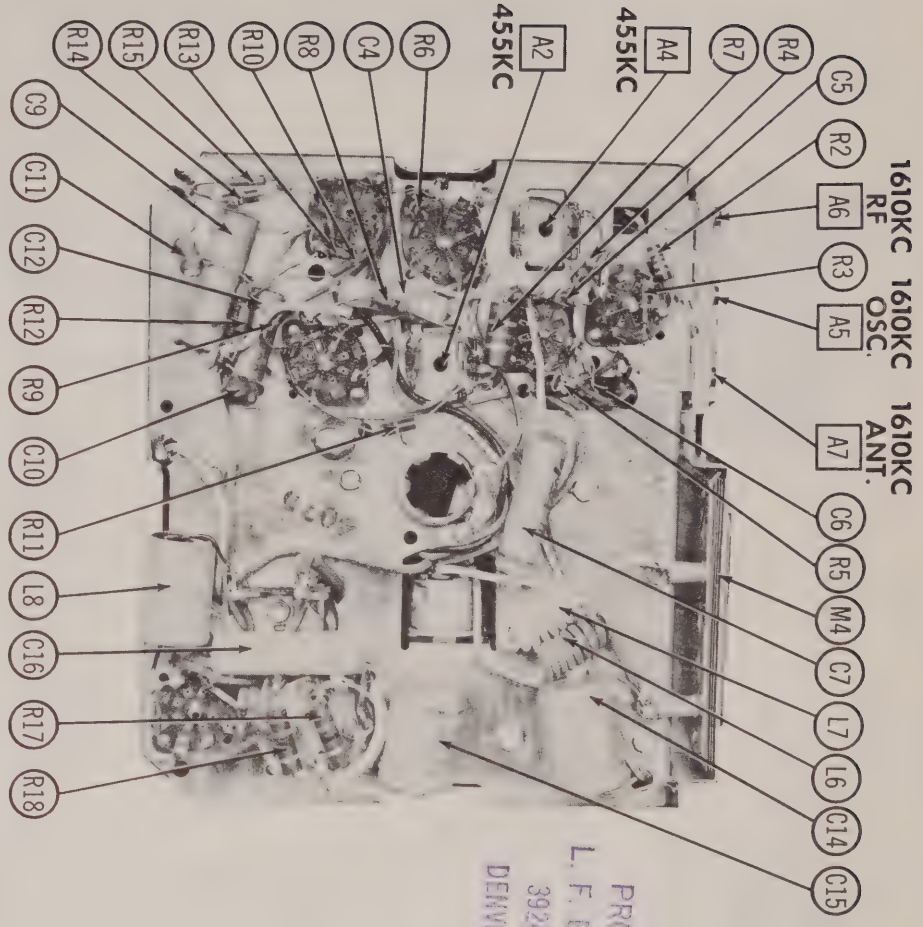
ITEM No.	TYPE	RATING	REPLACEMENT DATA MOTOROLA PART No. FUSE	MOTOROLA PART No. HOLDER	LITTELFUSE PART No. FUSE	LITTELFUSE PART No. HOLDER	BUSS PART No. FUSE	BUSS PART No. HOLDER
M2	SFE	9A 32V	65K16248	9K592647 *	307009 (9A-SFE)	155009	SFE 9	HRH *

* Includes fuse complete with holder.

MISCELLANEOUS

ITEM No.	PART NAME	MOTOROLA PART No.	NOTES
M3	Tuning Unit	1U510840	Complete - Model MT-92
M4	Spark plate	1V592329	
A5	Trimmer Strip	20K592078	Osc. (500-580MMF)
A6	Trimmer Strip	20K592078	RF (50-280MMF)
A7	Trimmer Strip	20K592078	Ant. (20-180MMF)

CHASSIS—BOTTOM VIEW



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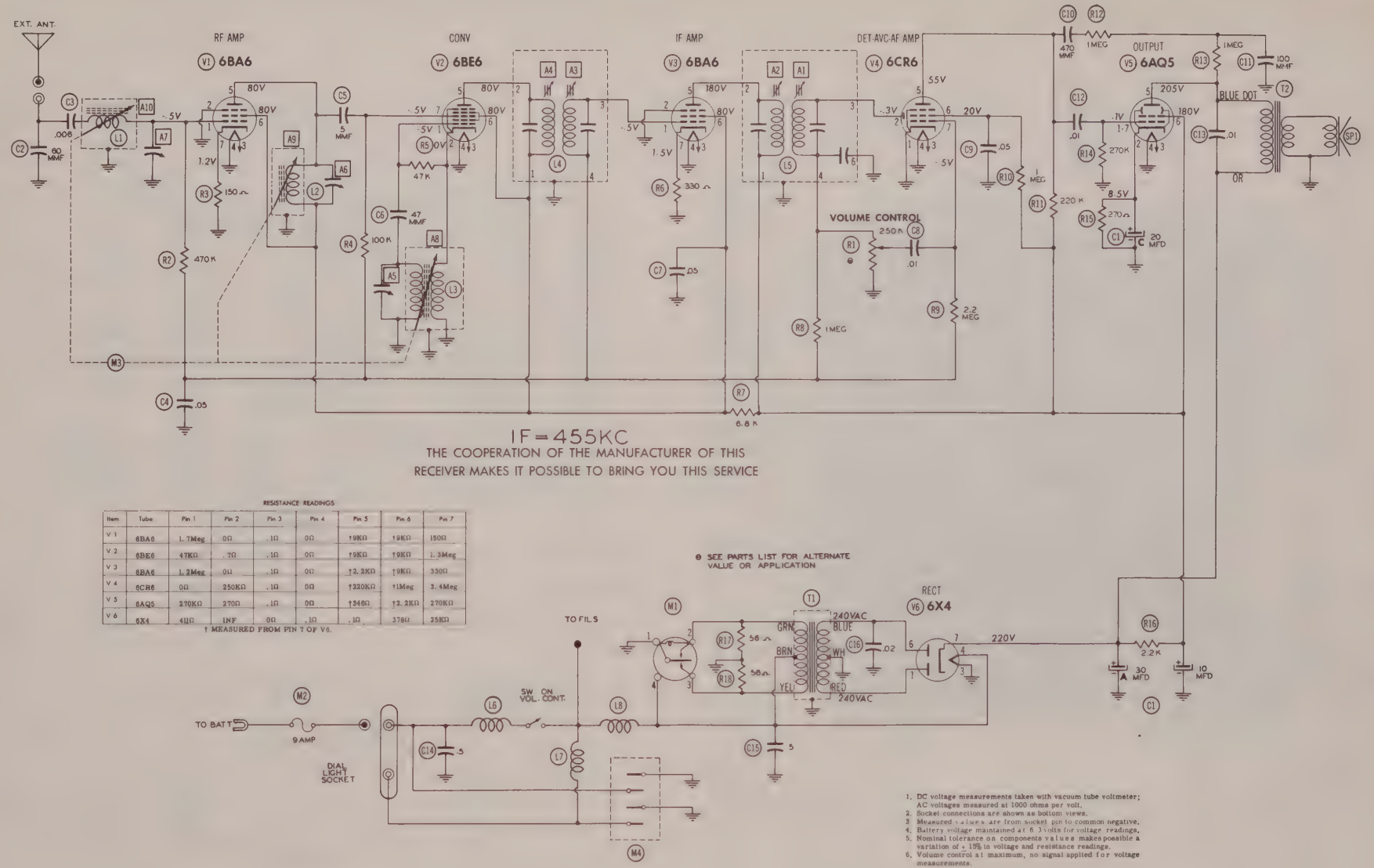
MOTOROLA MODEL 504



IF=455KC

THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V 1	6BA6	1.7Meg	0Ω	.1Ω	0Ω	†9KΩ	†9KΩ	150Ω
V 2	6BE6	47KΩ	.7Ω	.1Ω	0Ω	†9KΩ	†9KΩ	1.3Meg
V 3	6BA6	1.2Meg	0Ω	.1Ω	0Ω	†2.2KΩ	†9KΩ	330Ω
V 4	6CR6	0Ω	250KΩ	.1Ω	0Ω	†220KΩ	†1Meg	3.4Meg
V 5	6AQ5	270KΩ	270Ω	.1Ω	0Ω	†346Ω	†2.2KΩ	270KΩ
V 6	6X4	41Ω	INF	0Ω	.1Ω	.1Ω	378Ω	25KΩ

† MEASURED FROM PIN 7 OF V6.

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Battery voltage maintained at 6.3 volts for voltage readings.
5. Nominal tolerance on components values makes possible a variation of ± 15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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DENVER, COLORADO

OLDSMOBILE
MODEL 983091

TRADE NAME Oldsmobile Model 983091
SUPPLIER Oldsmobile Motors, Div. Of General Motors, Lansing, Mich.
TYPE SET Battery Operated Custom Built Automobile Superheterodyne Receiver
TUBES (Eight) Types 12BA6 RF Amp., 12BE6 Conv., 12BA6 IF Amp., 12BF6 Det-AVC-AF Amp., (2) 12V6GT Output, 12AU6 Trigger Amp., 0Z4 Rectifier

POWER SUPPLY 12 volt Storage Battery RATING 3 Amp. @ 12.6 Volts DC
TUNING RANGE—BROADCAST 540-1600KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Attenuate signal generator output to maintain not more than 2 volts at VTVM. Use an insulated screw driver for adjusting.
To tune to high frequency end stop insert a 0.07" feeler gauge (or bare #13 wire) in slot against the high frequency end stop.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
1	.1MFD	High side to pin 7 (grid) of 12BE6 (V2). Low side to chassis.	262KC (400~ Mod.)	High frequency end stop.	DC probe to ungrounded side of C2. Common to chassis.	A1, A2 A3	Adjust in order given for maximum deflection.
2	"	"	"	"	"	A4	Adjust for minimum deflection.
3	68MMF	High side to antenna receptacle. Low side to chassis.	1615KC	"	"	A5, A6 A7	Check to see that rear of oscillator core (A8) is 1 25/32" from mounting end of coil form. If necessary, make this adjustment with insulated screwdriver from mounting end of coil form. Reseal core stud. Adjust A5, A6 and A7 in order given for maximum deflection.
4	"	"	600KC	Tune to 600KC signal.	"	A9, A10	Adjust for maximum deflection.
5	"	"	1615KC	Tune to 1615KC signal.	"	A6, A7	"
6	"	"	1000KC	Tune to 1000KC signal.	"		If necessary, set the dial pointer to 1000KC. The dial pointer adjustment screw is located on the end of the core guide bar.
7	With radio installed in car and antenna fully extended tune in a weak station between 600 and 1000KC and adjust A7 for maximum volume.						

PUSH BUTTON ALIGNMENT

1. Open the hinged door just below the dial so that the selector tabs are exposed.
2. Tune manually to the desired station nearest the left side of the dial.
3. Move the selector tab on the extreme left until the tab coincides with the pointer tip. Repeat above procedure for remaining selector tabs choosing stations from left to right on the dial.

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PARTS LIST AND DESCRIPTIONS

WEBSTER ELECTRIC
MODEL RFM1

TUBES (SYLVANIA, GENERAL ELECTRIC, WESTINGHOUSE)

ITEM No.	USE	REPLACEMENT DATA		RETMA BASE TYPE	NOTES
		Oldsmobile PART No.	STANDARD REPLACEMENT		
V1	RF Amplifier	12BA6	12BA6	7BK	
V2	Converter	12BE6	12BE6	7CH	
V3	IF Amplifier	12BA6	12BA6	7BK	
V4	Det.-AVC-AF Amp.	12BF6	12BF6	7BT	
V5	Output	12V6GT	12V6GT	7S	
V6	Output	12V6GT	12V6GT	7S	
V7	Trigger Amp.	12AU7	12AU7	9A	
V8	Rectifier	0Z4	0Z4	4R	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

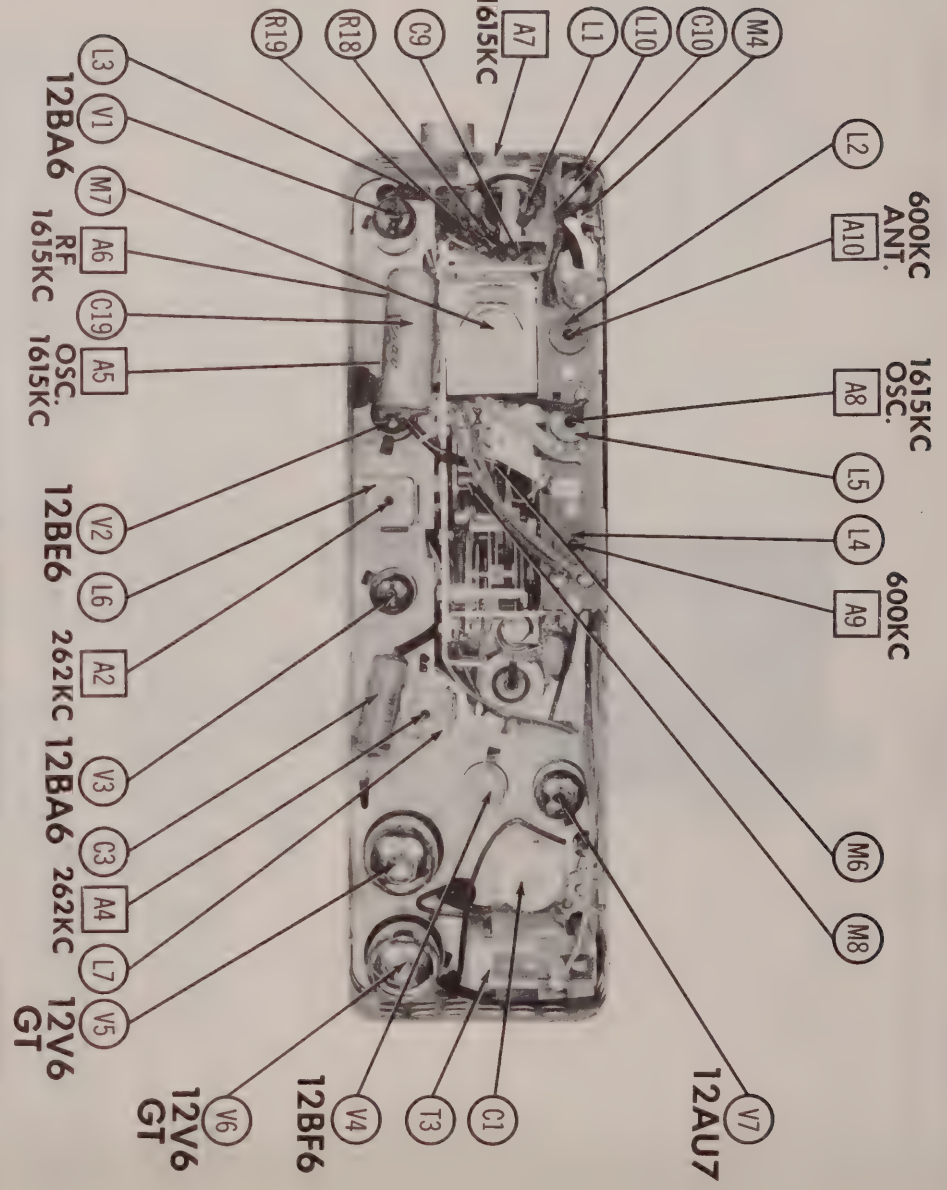
ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	Oldsmobile PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C1A	■20	400	M908	AFH3-120		C099		FP345.8	TVL-3678	
B	▲20	400								
C	20	25								
C2	.05	400	6512	P488-05	DF-503	CUB4S5		PT415	4TM-S5	
C3	.1	400	6590	P488-1	DF-104	CUB4P1		PT401	4TM-P1	
C4	68	500	G-680	1469-680	MD-680	22R5Q68	NP0-337-680		MS-47	
C5	39	500	G-390	1469-390	MD-390	22R5Q39	NP0L-390	MCB223	MS-44	
C6	260		7257567							
C7	100	500	G-101	1469-101	MD-101	22R5T1	NP0-337-101	MCB235	MS-31	
C8	100	500	G-101	1469-101	MD-101	22R5T1	NP0-333-101	MCB235	MS-31	
C9	68	500	G-680	1469-680	MD-680	22R5Q68	NP0-337-680		MS-47	
C10	.002	600	6528	P688-002	D6-202	CUB6D2	GP2-333-202	PT622	6TM-D2	
C11	.003	600	6529	P688-003	D6-302	CUB6D3	GP2-333-302	PT623	6TM-D3	
C12	220	500	G-221	1468-221	D6-221	5W5T22	GP2K-221	UC-5322	5GA-T22	
C13	.1	400	6513	P488-1	DF-104	CUB4P1		PT401	4TM-P1	
C14	.015	600	7237719	P688-015	DD16-153	CUB6S15		PT6115	6TM-S15	
C15	.003	1000	H-302	P1088-003	DD16-302	CUB16D3	1R5KV-332	PT1623	MB-D3	
C16	.0015	600		P688-0015	D6-152	CUB6D15	GP2L-152	PT6215	6TM-D15	Note 1
C17	.05	200	6512	P288-05	DF-503	CUB2S5		PT415	2TM-S5	
C18	.1	200	6513	P288-1	DF-104	CUB2P1		PT401	2TM-P1	
C19	.5	200	6592	P288-5		CUB2P5		PT405	2TM-P5	
C20	.007	1600	H-702	P1688-007	DD16-702	CUB16D7		PT1627	MB-D7	
C21	.47	100	7257906	P185-5		MP2P5		RF480	68P20	
C22	.5	100	6592	P185-5		MP2P5		RF480	68P20	

Note 1. Some versions use .002MFD in this application (part #6528)

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					¶NSTALLATION NOTES
	RESIST-ANCE	WATTS	Oldsmobile PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	
R1A	500KΩ	1/2	7264128				UF55A	Tone (Panel)
B	1.5Meg						UR26T25	Volume Tapped at 300K (rear)
C	Shaft						EB-214	Attach to R1A
D	Switch						US-26T	Attach to R1B

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	OLDSMOBILE PART No.	IRC PART No.	
R2	2.2Meg	1/2	A-225	BTS-2.2Meg	
R3	100Ω	1	A-101	BTS-100	
R4	10KΩ	1	B-103	BTA-10K	
R5	330KΩ	1/2	A-334	BTS-330K	
R6	22KΩ	1/2	A-223	BTS-22K	
R7	1.5Meg	1/2	A-155	BTS-1.5Meg	
R8	10Ω	1/2	A-100	BTS-10	
R9	150Ω	1/2	A-151	BTS-150	
R10	12KΩ	1/2	1213254	BTS-12K	
R11	1Meg 5%	1/2	1220169	BTS-1Meg 5%	
R12	1Meg 5%	1/2	1219492	BTS-1Meg 5%	
R13	47KΩ	1/2	A-473	BTS-47K	
R14	1Meg 5%	1/2	1220169	BTS-1Meg 5%	
R15	1000 5%	1/2	1220176	BTS-1000 5%	
R16	3300Ω 5%	1/2	1220173	BTS-330 5%	
R17	47KΩ	1/2	B-273	BTS-47K	Note 1
R18	100KΩ	1/2	A-104	BTS-100K	
R19	1Meg 5%	1/2	1220169	BTS-1Meg 5%	
R20	360Ω	1	7254563	BTA-360	
R21	120KΩ	1/2	1213271	BTS-120K	
R22	47KΩ	1	B-473	BTA-47K	
R23	22KΩ	1/2	A-223	BTS-22K	Note 2
R24	1000Ω	1/2		BTS-1000	Note 3
R25	220Ω	1/2	A-102	BTS-220	Note 4
R26	560Ω	1/2	1213229	BTS-560	
R27	2200Ω	1/2	A-222	BTS-2200	
R28	12KΩ	1	1213740	BTA-12K	
R29	5.6Meg	1	A-565	BTA-5.6Meg	
R30	6800Ω	1	1216154	BTA-6800	
R31	47KΩ	1	1220188	BTA-47K	
R32	1800Ω	2		BTB-1800	
R33	15KΩ	1	B-153	BTA-15K	

Note 1: Some versions may use a 27KΩ in this application.
Note 2: Not used in all versions.
Note 3: Some versions may use a 1200Ω in this application.
Note 4: Some versions may use a 1000Ω in this application.

TRANSFORMER (POWER)

ITEM No.	RATING				REPLACEMENT DATA					
	PRI.	SEC. 1	SEC. 2	SEC. 3	Oldsmobile PART No.	Stancor PART No.	Merit PART No.	Triad PART No.	Halldorson PART No.	Thordarson PART No.
T1	12.6VCT @2.4A	384VCT .062ADC			6067					

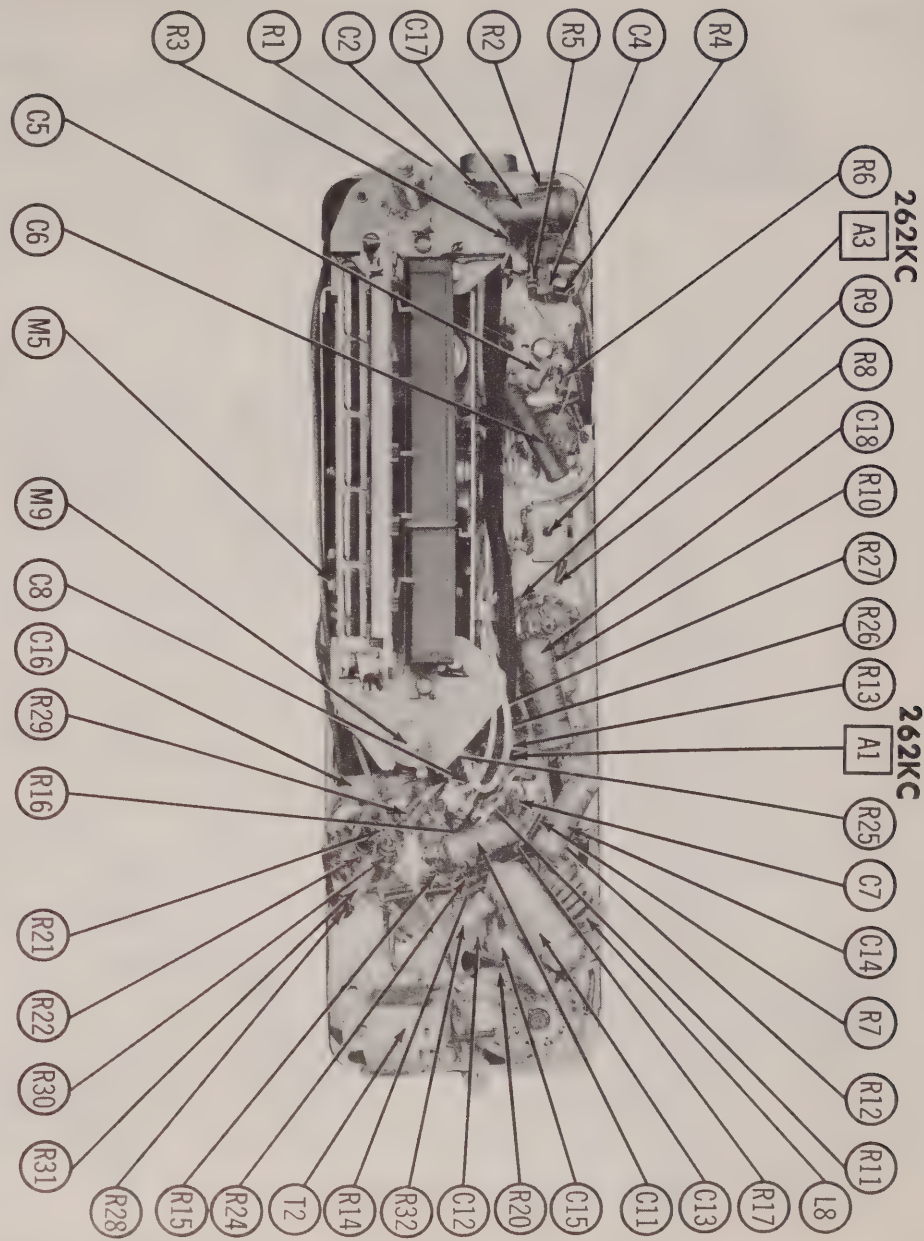
TRANSFORMER (INPUT)

ITEM No.	RATING				REPLACEMENT DATA					
	PRI.	SEC. 1	SEC. 2	SEC. 3	OLDSMOBILE PART No.	Stancor PART No.	Merit PART No.	Triad PART No.	Halldorson PART No.	Thordarson PART No.
T2	1.8KΩCT RES				6061					

SPEAKER

ITEM No.	RATINGS			REPLACEMENT DATA			NOTES
	SIZE	FIELD	V. C. IMP.	OLDSMOBILE PART No.	JENSEN PART No.	QUAM PART No.	
SP1	8"	PM	3.9Ω	7263090	ST-115 Mod. P8-V	8A21	

CHASSIS—BOTTOM VIEW



WEBSTER ELECTRIC MODEL RFM

WEBSTER ELECTRIC MODEL RFM

PARTS LIST AND DESCRIPTIONS (Continued)

COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA				NOTES
		PRI.	SEC.	Oldsmobile PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L1	Ant. Loading Coil	0Ω		7255738	19-1004		4610	7 Microhenries
L2	Ant. Coil	10Ω		7257979				
L3	Ant. Coupling Coil	4.8Ω		7240251	19-6022		4626	26 Microhenries
L4	RF Coil	9.5Ω		7257979				
L5	Osc. Coil	.9Ω	4Ω	7263287				
L6	Input IF	38Ω	36Ω	1219508	16-6752	BC-350	12-H1	
L7	Output IF	30Ω	28Ω	1220204	16-6754	BC-354	12-H6	
L8	Fil. Choke	0Ω		1217846	19-1001		4604	1.4 Microhenries
L9	Vibrator Hash Choke	.1Ω		7264693			5221	
L10	Fil. Choke	0Ω		1217846	19-1001		4604	1.4 Microhenries

VIBRATOR

ITEM No.	TYPE	INPUT VOLTS	FRE-QUENCY	REPLACEMENT DATA				NOTES
				OLDSMOBILE PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	RADIART PART No.	
M1	Interuper	12.6V	115v	8550	6330	G-874	6330	

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			OLDSMOBILE PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M2	7AG	7.5A	455640		30307.5 (7.5A-7AG)		AGW 7½	

PARTS LIST AND DESCRIPTIONS (Continued)

MISCELLANEOUS

ITEM No.	PART NAME	Oldsmobile PART No.	NOTES
M3	Dial Light		#57
M4	Spark Plate	1212278	
M5	Switch	7263912	Station Selector
M6	Relay Assy.	1221326	
M7	Solenoid & Plunger Assy.	7263425	
M8	Switch	7263340	Tuner Return
M9	Control	7264726	Sensitivity
M10	Switch	7263209	Foot Station Selector
A5,A6	Trimmer Cap.	7242454	Dual - RF & Osc.
A7	Trimmer Cap.	7262997	Ant.
	Button & Slide Assy.	7264412	
	Dial	7264191	
	Dial Backplate	7264594	
	Tab	1220192	Indicator (Set of 5)
	Pointer Assy.	7264217	
	Pointer backplate	7264421	
	Push button Slide Contact	1220191	(Set of 5)
	Tab Board Rail	7263703	

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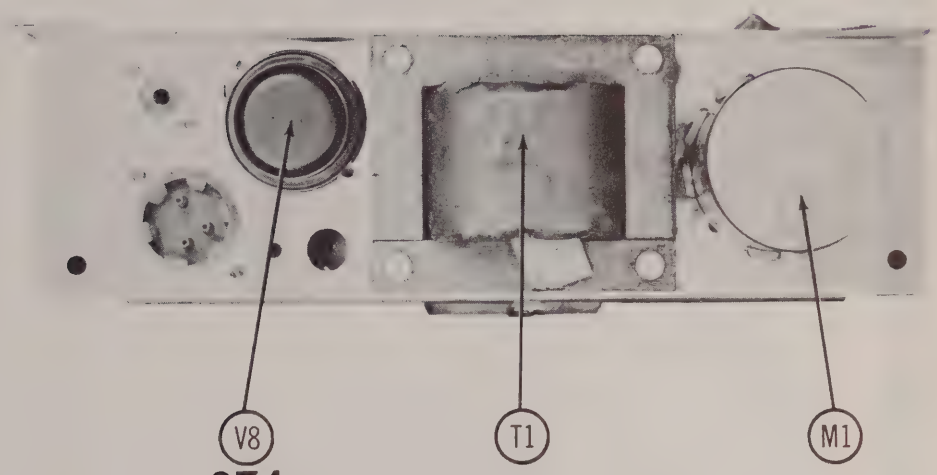

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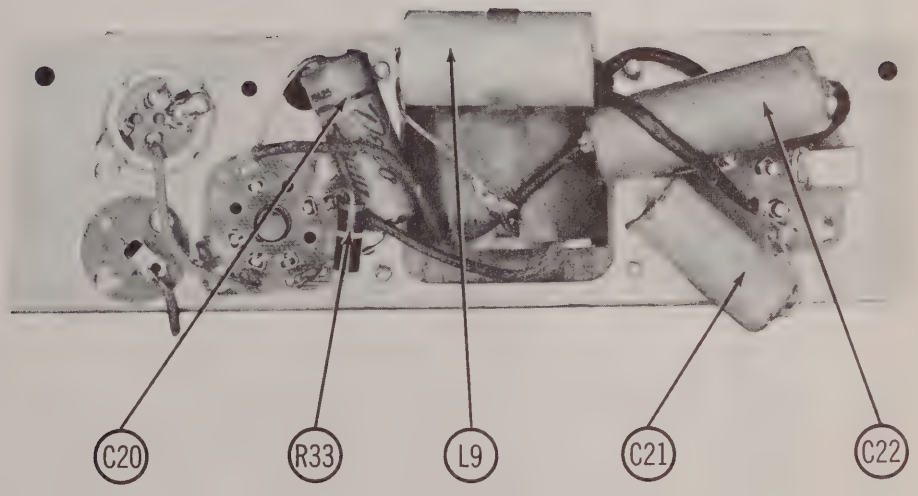

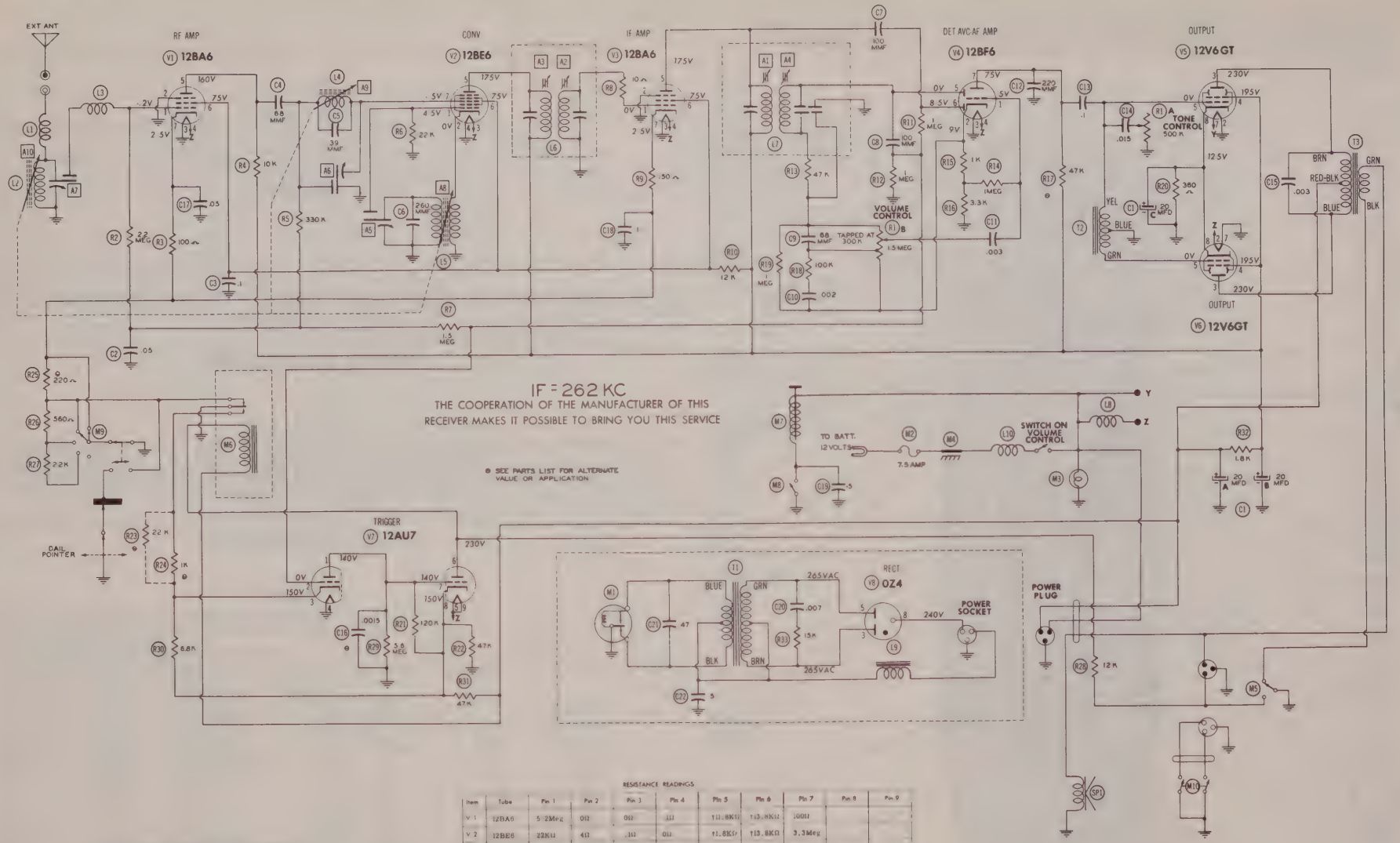

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	12BA6	5.2Meg	0Ω	0Ω	1Ω	†13.8KΩ	†13.8KΩ	100Ω		
V 2	12BE6	22KΩ	4Ω	.1Ω	0Ω	†1.8KΩ	†13.8KΩ	3.3Meg		
V 3	12BA6	37Ω	0Ω	0Ω	.1Ω	†1.8KΩ	†13.8KΩ	150Ω		
V 4	12BF6	1Meg	4.3KΩ	0Ω	.1Ω	2.8Meg	900KΩ	28.8KΩ		
V 5	12V6GT	1.8KΩ	0Ω	†360Ω	†1.8KΩ	1.8KΩ	INF	.1Ω	360Ω	
V 6	12V6GT	INF	.1Ω	†360Ω	†1.8KΩ	1.8KΩ	INF	0Ω	360Ω	
V 7	12AU7	†100KΩ	1.5Meg	†45KΩ	0Ω	.1Ω	†12KΩ	†100KΩ	†45KΩ	.1Ω
V 8	0Z4	0Ω	INF	214Ω	INF	256Ω	INF	13KΩ	45KΩ	

† MEASURED FROM PIN 8 OF V8.

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Battery voltage maintained at 12.6 volts for voltage readings.
5. Nominal tolerance on components values makes possible a variation of ± 10% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

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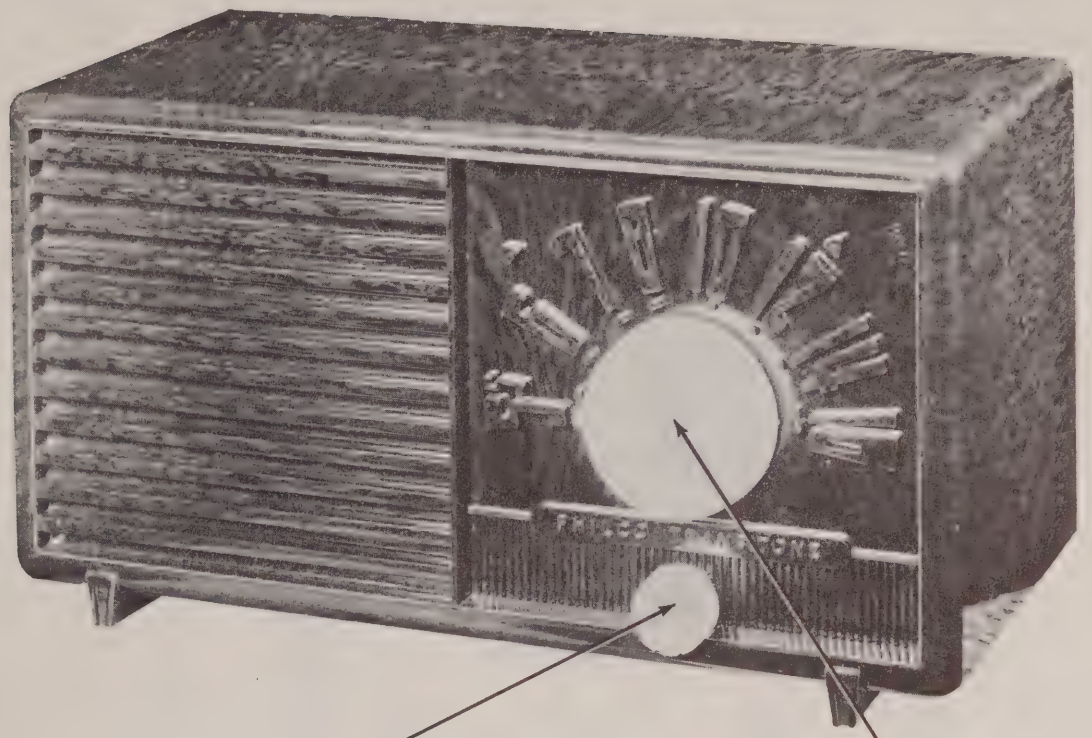
PHILCO
MODEL B569 (Code 121)



PHILCO
MODEL B569 (Code 121)

TRADE NAME	Philco Model B569 (Code 121)
MANUFACTURER	Philco Corp., Tioga & "C" Sts., Philadelphia, Pa.
TYPE SET	AC-DC Operated AM Superheterodyne Receiver
TUBES (Five)	Types 12BE6 Conv., 12BA6 IF Amp., 12AV6 Det.-AVC-AF Amp., 35C5 Output, 35W4 Rectifier
POWER SUPPLY	105-120 Volts AC-DC — RATING .22 Amp. @ 117 Volts AC
TUNING RANGE—BROADCAST	540-1620KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Use isolation transformer, if available. If not, connect a .1MFD capacitor in series with low side of signal generator and B-. Loop should be maintained in same relative position to chassis as when receiver is in cabinet. Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.1MFD	High side to pin 7 (grid) of 12BE6 (V1). Low side to B-.	455KC (400~Mod)	Tuning gang fully open	Across voice coil	A1, A2, A3, A4	Adjust for maximum output. If isolation transformer is not used, reduce dummy antenna to .001MFD to reduce hum modulation.
2.		Loop	1630KC	"	"	A5	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
3.		"	1500KC	Tune to 1500KC signal	"	A6	"

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PARTS LIST AND DESCRIPTIONS

PHILCO
MODEL B569 (Code 121)

TUBES (SYLVANIA, GENERAL ELECTRIC, WESTINGHOUSE)

ITEM No.	USE	REPLACEMENT DATA		RETMA BASE TYPE	NOTES
		PHILCO PART No.	STANDARD REPLACEMENT		
V1	Converter	12BE6	12BE6	7CH	
V2	IF Amplifier	12BA6	12BA6	7BK	
V3	Det.-AVC-AF Amp	12AV6	12AV6	7BT	
V4	Output	35C5	35C5	7CV	
V5	Rectifier	35W4	35W4	5BQ	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	PHILCO PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C1A	80	150	30-2575-40	PRS150/80-40		BBRT44215		3N532	TVA-2460	Orange Red
B	20	150								
C2	.05	200	45-3505-28	P288-05	DF-503	PJ2S5		PT415	2TM-S5	
C3	47		30-1230-4							
C4	5000		30-1238-1	BPD-005	DD-502	K080	801-005	DC-525	5HK-D5	
C5A	5000									
B	250		♦30-6001	♦PA-112-1	♦PC-70	♦112TM1	♦1406-01		♦T-3	
C										
C6	.022	400	30-4650-43	P488-022		CUB4S22		PT422	4TM-S22	
C7	.047	400	30-4650-45	489ZX-05	DF-503	CUB4S5		PT415	4TM-S5	
C8	.2	400	30-4650-49	P488-2		CUB4P2		PT402	4TM-P2	

♦ Items C5A, C5B, C5C, R7A and R7B are combined in one unit.
When replacing items separately items C5B and C5C should total 250MMF.

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	PHILCO PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	
R1A	500KΩ	½	33-5566-41	Q13-133	A47-500K-Z	B-60-S	U-48	Volume
B	Shaft		Not Req.	Not Req.	FS-3	Not Req.	Not Req.	Attach to R1A
C	Switch		Not Req.	76-1	SWE-12	Not Req.	US-26	Attach to R1A

RESISTORS

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	PHILCO PART No.	IRC PART No.	
R2	22KΩ	½	66-3228340	BTS-22K	
R3	56Ω	½	66-0568340	BTS-56	
R4	2.2Meg	½	66-5228304	BTS-2.2Meg	
R5	47KΩ	½	66-3478340	BTS-47K	
R6	10Meg	½	66-6108340	BTS-10Meg	
R7A	500KΩ	½	♦30-6001		
B	500KΩ	½			

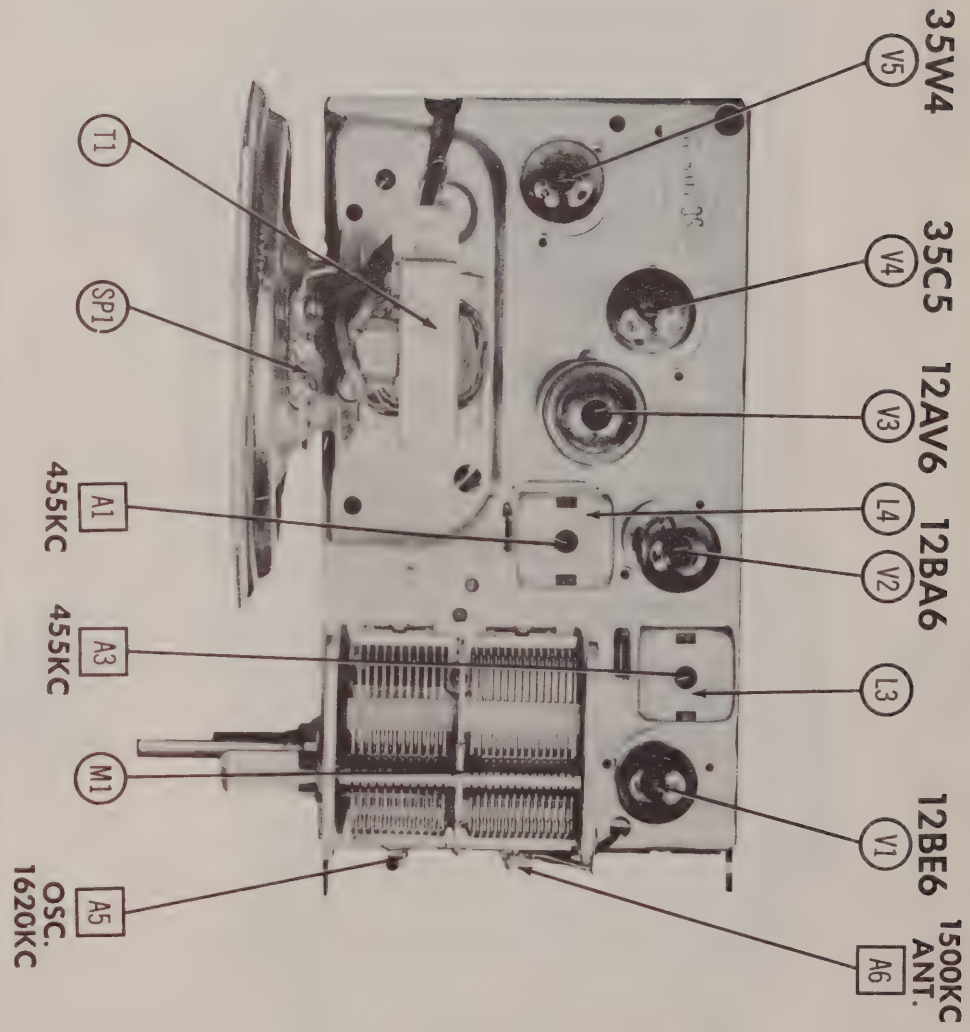
ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	PHILCO PART No.	IRC PART No.	
R8	150Ω	½	66-1158340	BTS-150	
R9	1000Ω	1	66-2108340	BTS-1000	
R10	100Ω		66-1104340	BTA-100	
R11	100Ω		33-1343-3		Note 1

Note 1. Tube saver resistor 880Ω at room temperature, resistance drops to 100Ω as tubes heat up.
♦ Items R7A, R7B, C5A, C5B, C5C are combined in one unit.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	PHILCO PART No.	Stancor PART No.	Merit PART No.	Triad PART No.	Halldorson PART No.	Thordarson PART No.	
T1	2.7KΩ	3.3Ω	32-8384	A-3332	A-3025	S-12X	Z1101		

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

SPEAKER

ITEM No.	RATINGS			REPLACEMENT DATA			NOTES
	SIZE	FIELD	V. C. IMP.	PHILCO PART No.	JENSEN PART No.	QUAM PART No.	
SP1	4"	PM	3.3Ω	36-1654	ST-113 Mod. P4-X	4A07	

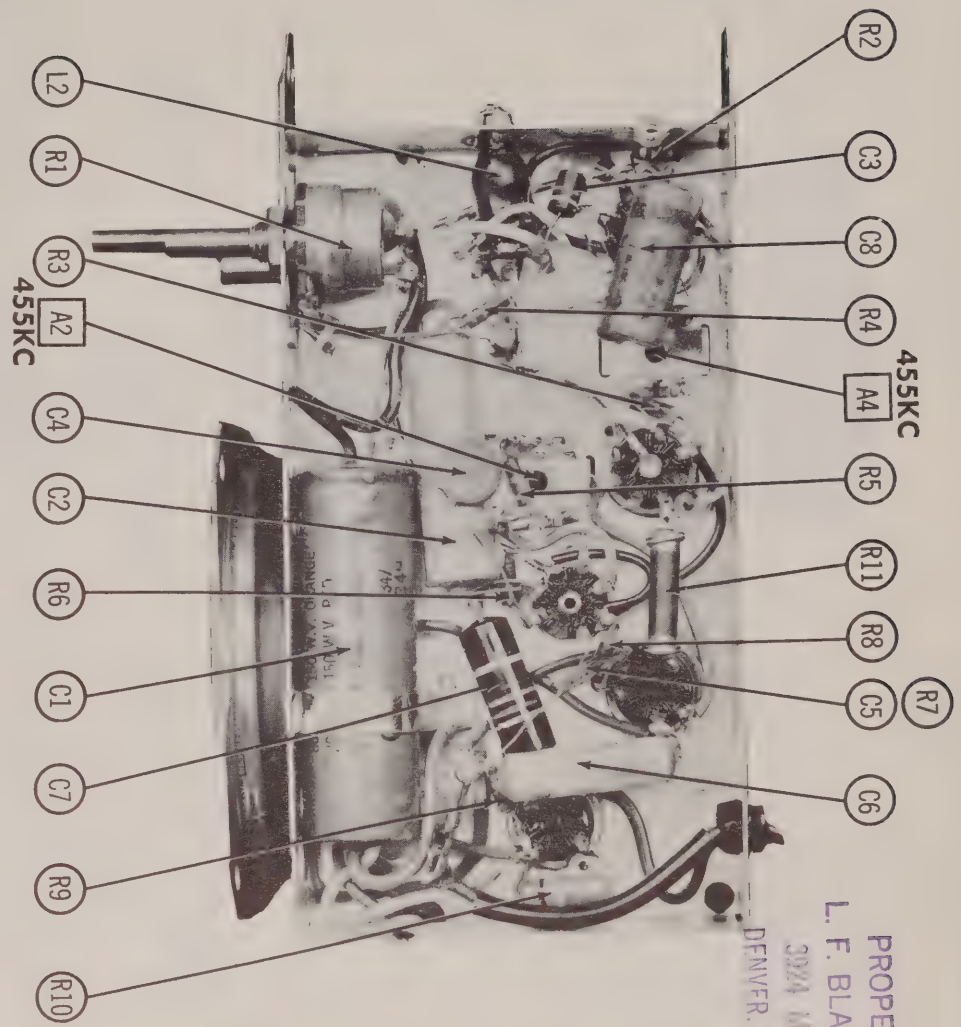
COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA				NOTES
		PRI.	SEC.	PHILCO PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L1	Loop Ant.	2.9Ω		76-8777				Includes cabinet back
L2	Osc. Coil	.9Ω	6Ω	32-4453-6	14-1074	BC-381	71-Osc.	
L3	Input IF	15Ω	15Ω	32-4161A	16-6758	BC-352	12-C1	
L4	Output IF	15Ω	15Ω	32-4240A	16-6770	BC-355	12-C6	

MISCELLANEOUS

ITEM No.	PART NAME	PHILCO PART No.	NOTES
M1	Tuning Cap.	31-2751-13	32-495MMF, 20-170MMF
M2	Cabinet	11029	
M3	Knob	54-4969-2	Tuning
M4	Knob	27-4815-13	Volume

CHASSIS—BOTTOM VIEW



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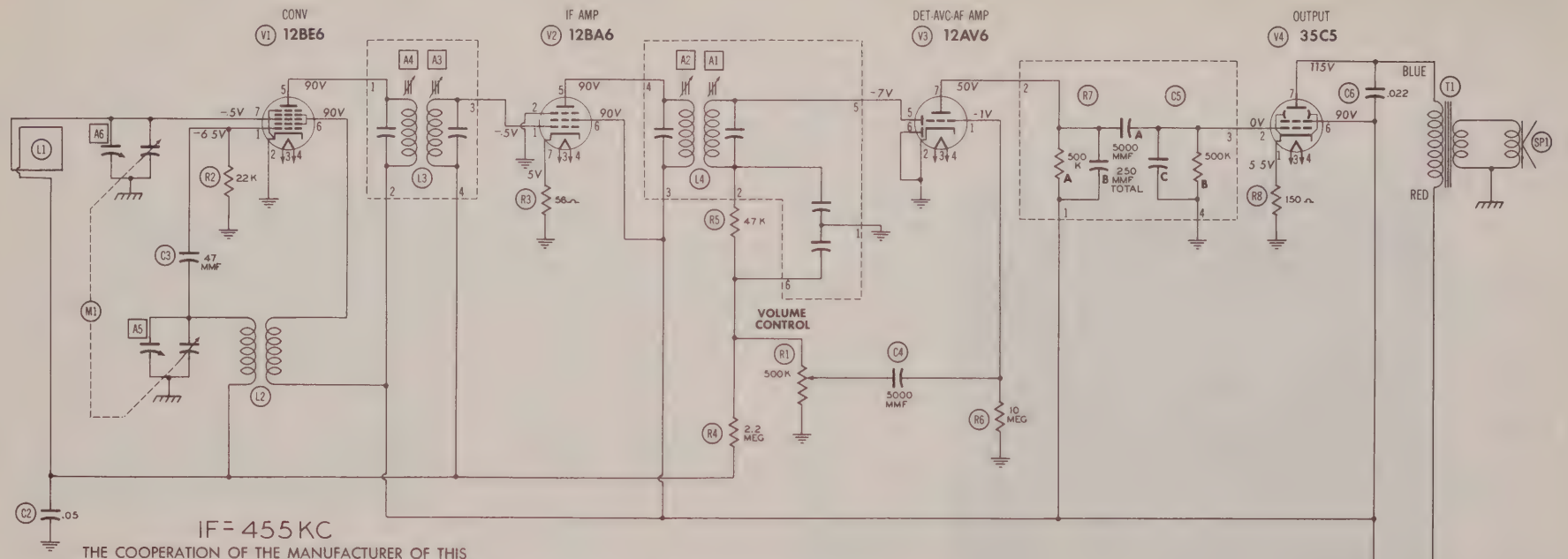
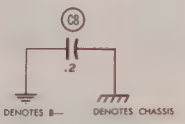
PHILCO
MODEL B569 (Code 121)



IF = 455 KC

THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

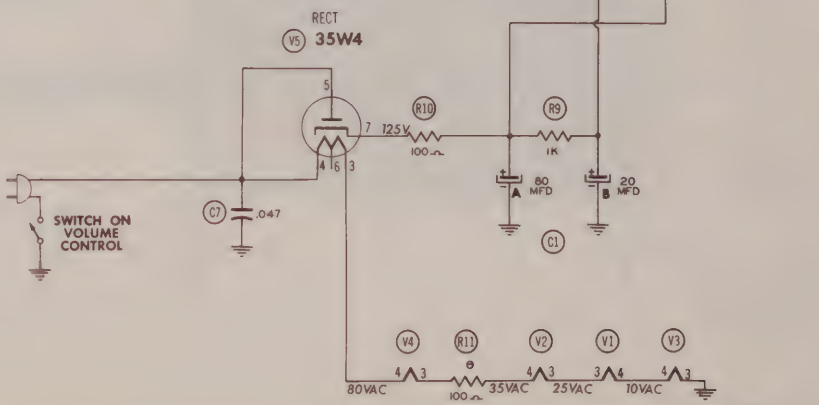
1. DC voltage measurements taken with vacuum tube voltmeter, AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.



RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V 1	12BE6	22KΩ	0Ω	24Ω	12Ω	†1.1KΩ	†1.1KΩ	2.4Meg
V 2	12BA6	2.4Meg	0Ω	24Ω	36Ω	†1.1KΩ	†1.1KΩ	56Ω
V 3	12AV6	10Meg	0Ω	0Ω	12Ω	550KΩ	0Ω	†500KΩ
V 4	35C5	150Ω	500KΩ	750Ω	785Ω	INF	†1.1KΩ	†274Ω
V 5	35W4	†100Ω	†100Ω	785Ω	820Ω	820Ω	INF	50KΩ

† MEASURED FROM PIN 7 OF V5



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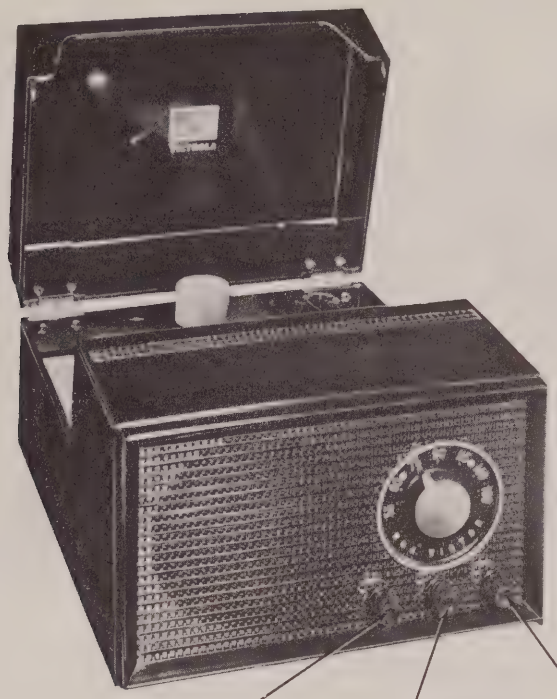
RCA VICTOR
MODEL 4-Y-511 (Ch. RC1134)



RCA VICTOR
MODEL 4-Y-511 (Ch. RC1134)

TRADE NAME	RCA Victor Model 4-Y-511 (Ch. RC1134)
MANUFACTURER	RCA Victor Div., Radio Corp. of America, Camden, N. J.
TYPE SET	AC Operated Radio - Phono Combination Superheterodyne Receiver With 45RPM Automatic Record Changer.
TUBES (Five)	Types 12BE6 Conv., 12BA6 IF Amp., 12AV6 Det.-AVC-AF Amp., 50C5 Output, 35W4 Rectifier
POWER SUPPLY	110-120 Volts AC-60 Cycles
RATING	.24 Amp. @ 117 Volts AC
TUNING RANGE—BROADCAST	540KC - 1620KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.
Use isolation transformer, if available. If not, connect a .1MFD capacitor in series with low side of signal generator and B-.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1	.01MFD	High side to pin 1 (grid) of 12BA6 (V2). Low side to B-.	455KC (400~ Mod.)	Tuning gang Fully open	Across voice coil	A1, A2	Adjust for maximum output. If isolation transformer is not used, reduce dummy antenna to .001MFD to reduce hum modulation.
2	"	High side to pin 7 (grid) of 12BE6 (V1). Low side to B-.	"	"	"	A3, A4	Adjust for maximum output. Install chassis and record changer in cabinet. Connect antenna loop.
3		Loop	1620KC	"	"	A5	Fashion loop of several turns of wire and radiate signal into loop or receiver. Adjust for maximum output.
4		Loop	1400KC	Tune to 1400KC signal.	"	A6	"
5		Loop	600KC	Tune to 600KC signal.	"	A7	Adjust for maximum output, while rocking tuning gang thru 600KC signal. Repeat steps 3, 4 & 5 if necessary.

FOR SERVICE INFORMATION ON RECORD CHANGER UNIT RP-190 SEE PHOTOFACT SET #144-FOLDER #7 OR RECORD CHANGER MANUAL CM-4.

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PARTS LIST AND DESCRIPTIONS

RCA VICTOR
MODEL 4-Y-511 (Ch. RC1134)

TUBES (SYLVANIA, GENERAL ELECTRIC, WESTINGHOUSE)

ITEM No.	USE	REPLACEMENT DATA		RETMA BASE TYPE	NOTES
		RCA PART No.	STANDARD REPLACEMENT		
V1	Converter	12BE6	12BE6	7CH	
V2	IF Amp.	12BA6	12BA6	7BK	
V3	Det-AVC-AF Amp.	12AV6	12AV6	7BT	
V4	Output	50C5	50C5	7CV	
V5	Rectifier	35W4	35W4	5BQ	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	RCA PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C1A	80	150	75980	PRS150/80-40		BBRD8415		TCT3117	TVA-3455	Red
B	50	150								Green
C2	.047	200	73553	P288-047	DF-503	PJ2S47		PT4147	2TM-S47	
C3	56		75784	S156	D6-560	TP31	GP1K-560	UC-5456	5GA-Q56	
C4	4.7		77471							
C5	.047	400	73553	P488-047	DF-503	CUB4S47		PT4147	4TM-S47	
C6	.0015	600	76508	P688-0015	D6-152	TP54	GP2L-152	UC-5215	5GA-D15	
C7	.0056	400	73788	P488-0056	D6-562	CUB4D56	GP2-333-562	PT4256	4TM-D56	
C8A	220									
B	5000									
C	5000		♦79058	♦PA-113-2	♦PC-151	♦116TM2	▲1408-02		♦DT-2	
D	250									
E										
C9	.0047	400	739320	P488-0047	D6-472	CUB4D47	GP2-333-472	PF4247	4TM-D47	
C10	.047	400	73553	P488-047	DF-503	PJ4S47		PT4147	4TM-S47	
C11	.047	400	73553	P488-047	DG-503	PJ4S47		PT4147	4TM-S47	

♦ Items C8A, C8B, C8C, C8D, C8E, R8A, R8B and R8C are combined in one unit. When replacing items individually, items C8D and C8E should total 250 MMF.

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	RCA PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	
R1A	1Meg	½	79056	Q13-137X	A47F-1Meg	BT-72-S	UT-440	Volume tapped at 220KΩ
B	Shaft		Not Req.	Not Req.	FS-3	Not Req.	Not Req.	Attach to R1A
C	Switch		Not Req.	76-1	SWE-12	Not Req.	US-26	Attach to R1A

RESISTORS

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	RCA PART No.	IRC PART No.	
R2	33KΩ	½	504333	BTS-33K	
R3	100Ω	½	504110	BTS-100	
R4	100Ω	½	504110	BTS-100	
R5	47KΩ	½	504347	BTS-47K	
R6	3.3Meg	½	504533	BTS-3.3Meg	
R7	1Meg	½	504510	BTS-1Meg	

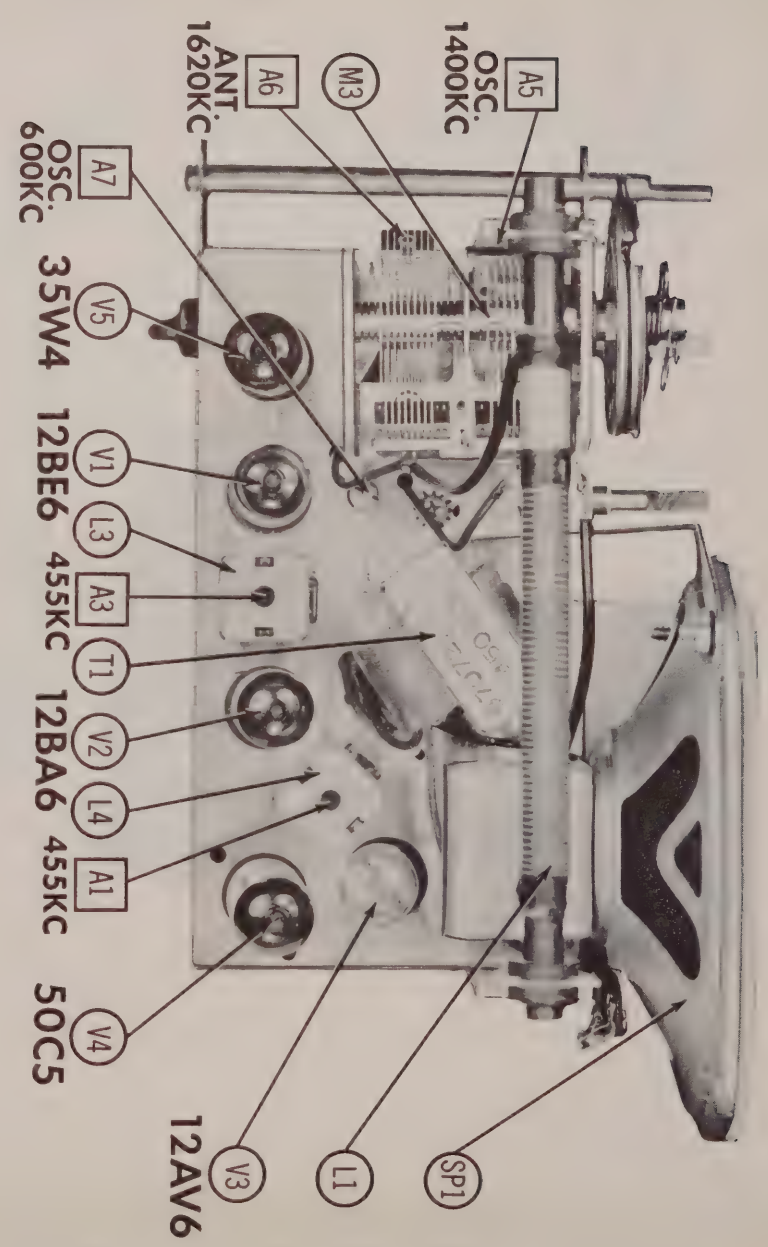
ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATT	RCA PART No.	IRC PART No.	
R8A	6.8Meg	½	♦79058	BTS-6.8Meg	
B	470KΩ	½		BTS-470K	
C	470KΩ	½		BTS-470K	
R9	150Ω	½	503115	BTS-150	
R10	1200Ω	1	513212	BTA-1200	
R11	56KΩ	½	503356	BTS-56K	
R12	33Ω	½	504033	BTS-33	

♦ Items R8A, R8B, R8C, C8A, C8B, C8C, C8D and C8E are combined in one unit.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	RCA PART No.	Stancor PART No.	Merit PART No.	Triad PART No.	Halldorson PART No.	Thordarson PART No.	
T1	2.6KΩ	3.3Ω	79055	A-3330	A-3031		Z1102	24550A	

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

SPEAKER

ITEM No.	RATINGS			REPLACEMENT DATA			NOTES
	SIZE	FIELD	V. C. IMP.	RCA PART No.	JENSEN PART No.	QUAM PART No.	
SP1	5 1/4"	PM	3.3Ω	78147	ST-803 Mod. P525	52A1	

COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA				NOTES
		PRI.	SEC.	RCA PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L1	Ant. Coil	.4Ω		79046				
L2	Osc. Coil	.6Ω	5.5Ω	79057	14-1074	BC-381	71-OSC	
L3	Input IF	18Ω	18Ω	75486	16-6758	BC-352	12-C1	
L4	Output IF	15Ω	15Ω	75487	16-6770	BC-355	12-C6	

PHONO CARTRIDGE

ITEM No.	REPLACEMENT DATA							REMARKS
	RCA PART No.	ASTATIC PART No.		SHURE PART No.		ELECTRO-VOICE PART No.		
		CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE	
M1	47067	AC-J	A-1	W31AR	A53MG	44	0-1 or 5-1	

ASTATIC, SHURE AND ELECTRO-VOICE NEEDLE LISTINGS SHOWN ABOVE ARE SPECIFIED FOR THE RESPECTIVE REPLACEMENT CARTRIDGES LISTED. FOR ORIGINAL CARTRIDGE NEEDLE REPLACEMENT SEE BELOW.

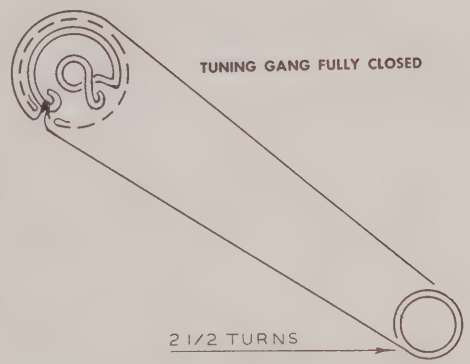
PHONO NEEDLE

(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

ITEM No.	REPLACEMENT DATA				REMARKS
	RCA PART No.	JENSEN PART No.	PERMO PART No.	WALCO PART No.	
M2	74068	† M-70LP or * M-71LP	† A-396 or ♦ A-396D	† W-42MGS or ♦ W-42MGD	* Metal † Jewel ♦ Diamond

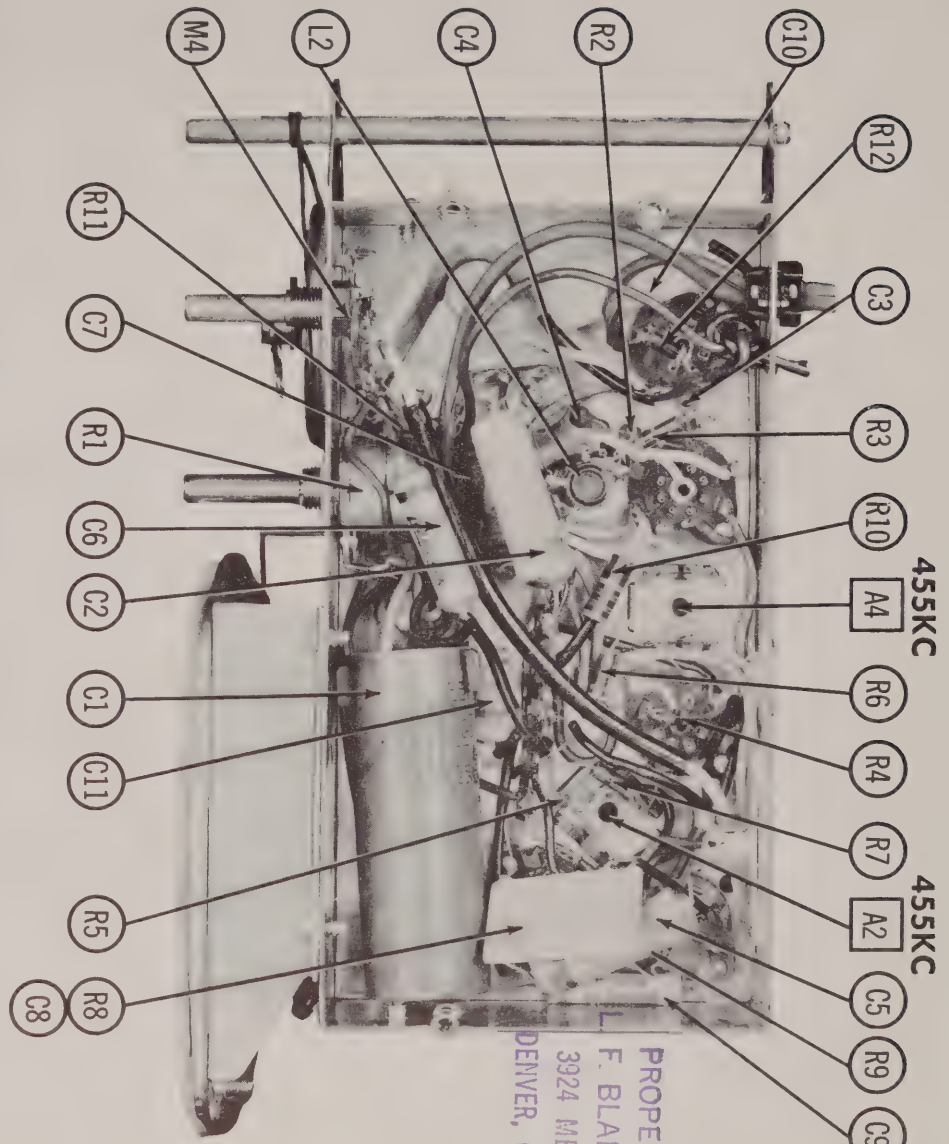
MISCELLANEOUS

ITEM No.	PART NAME	RCA PART No.	NOTES
M3	Tuning Cap.	79049	21-285 MMF; 16-135 MMF.
M4	Switch	79050	Radio - Phono
	Cabinet	42624	
	Knob	79060	On-Off-Volume, Radio-Phono Switch, & Tuning
	Pointer	79051	Dial



DIAL CORD STRINGING

CHASSIS—BOTTOM VIEW



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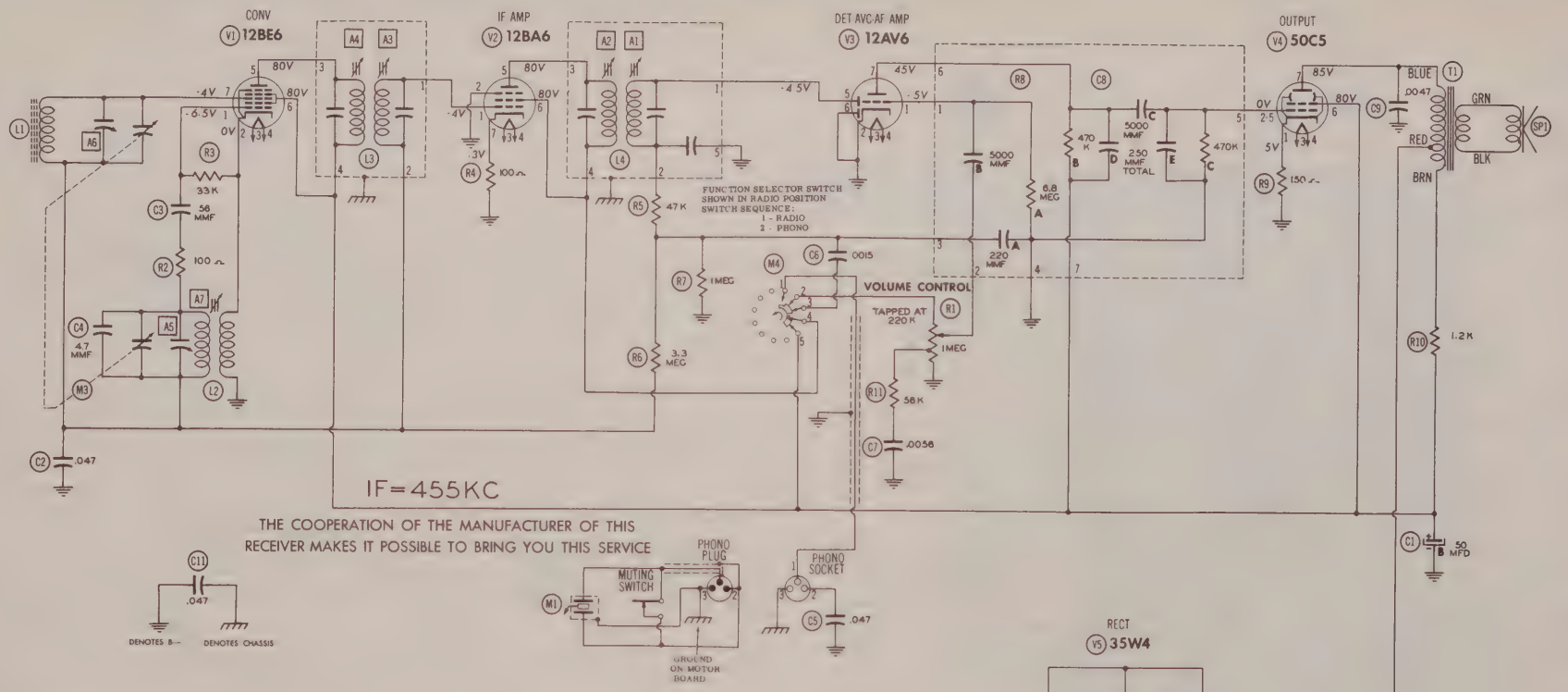

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V 1	12BE6	33KΩ	.7Ω	12Ω	24Ω	†1.2KΩ	†1.2KΩ	4.3Meg
V 2	12BA6	4.3Meg	0Ω	24Ω	36Ω	†1.2KΩ	†1.2KΩ	100Ω
V 3	12AV6	6.8Meg	0Ω	0Ω	12Ω	1Meg	0Ω	†470KΩ
V 4	50C5	150Ω	470KΩ	36Ω	85Ω	470KΩ	†1.2KΩ	†380Ω
V 5	35W4	120Ω	0Ω	85Ω	120Ω	120Ω	110Ω	60KΩ

† MEASURED FROM PIN #7 OF V5.
ALL MEASUREMENTS TAKEN IN "RADIO" POSITION

1. DC voltage measurements taken with vacuum tube voltmeter, AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured voltages are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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PHOTOFACT* Folder

RETMA MEMBER

RAYTHEON MODELS M-1750A, C, G, K, M-1751D, F, M-1752E, L, M-2160A, C, G, K, M-2161D, F, M-2162E, L (Ch. 17T18, 21T19)

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MODEL M-1750C

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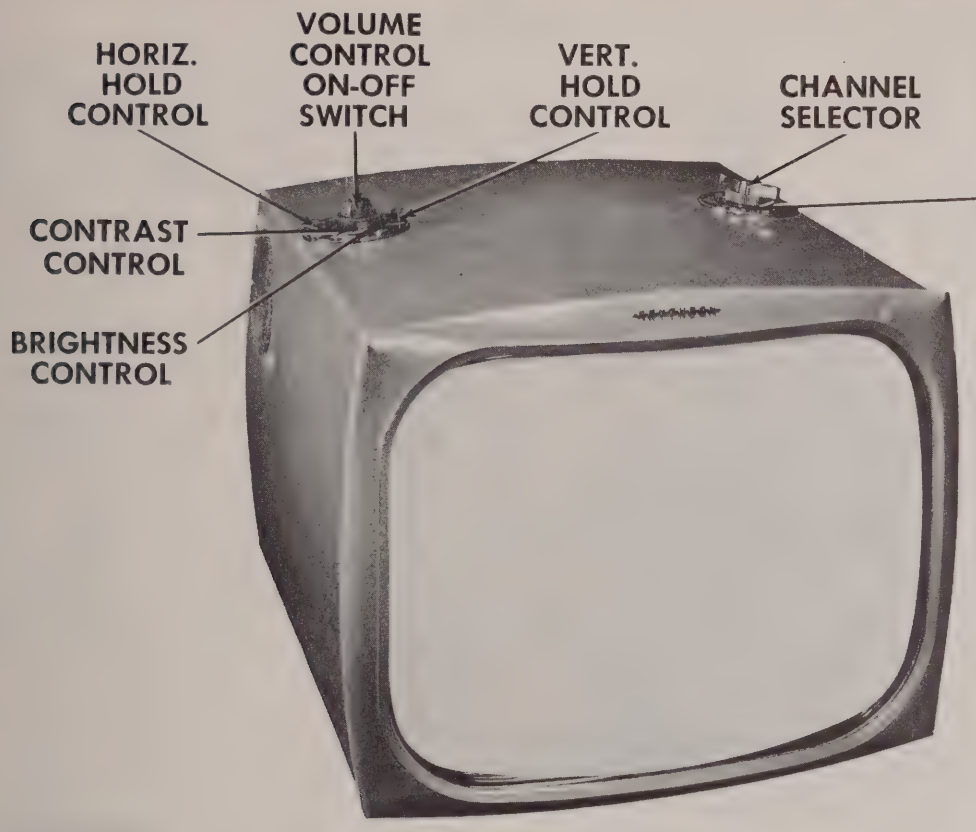

RAYTHEON MODEL M-1750C

TRADE NAME	RAYTHEON	MODELS	CHASSIS
		M-1750A, M-1750C, M-1750G, M-1750K	17T18
		M-1751D, M-1751F	17T18
		M-1752E, M-1752L	17T18
		M-2160A, M-2160C, M-2160G, M-2160K	21T19
		M-2161D, M-2161F	21T19
		M-2162E, M-2162L	21T19
MANUFACTURER	Raytheon Mfg. Co., Television & Radio Div., 5921 W. Dickens Ave., Chicago 39, Ill.		
TYPE SET	Television Receiver		
TUBES	Fifteen		
POWER SUPPLY	105-115 Volts AC-60 Cycle	RATING	1.38 Amp. @ 115 Volts AC
TUNING RANGE	Channels 2 thru 13, Video IF 26.75MC, Sound IF 22.25MC (Intercarrier)		

INDEX

Alignment Instructions 6, 7
Disassembly Instructions 18
Horizontal Sweep Circuit Adjustments 11
Parts List and Descriptions 14, 15, 16
Photographs
Cabinet-Rear View 11
Capacitor Identification 4, 9
Chassis-Top View 3
RF Tuner 10
Resistor Identification 19, 20
Photographs (Cont)
Trans., Inductor & Alignment Identification 13
Resistance Measurements 8
Servicing in the Field 18
Schematic 2
Trouble Shooting Aids 12, 17
Tube Failure Check Chart 5
Tube Placement Chart (Bottom View) 8
Tube Placement Chart (Top View) 5

RAYTHEON MODELS M-1750A, C, G, K, M-1751D, F, M-1752E, L, M-2160A, C, G, K, M-2161D, F, M-2162E, L (Ch. 17T18, 21T19)

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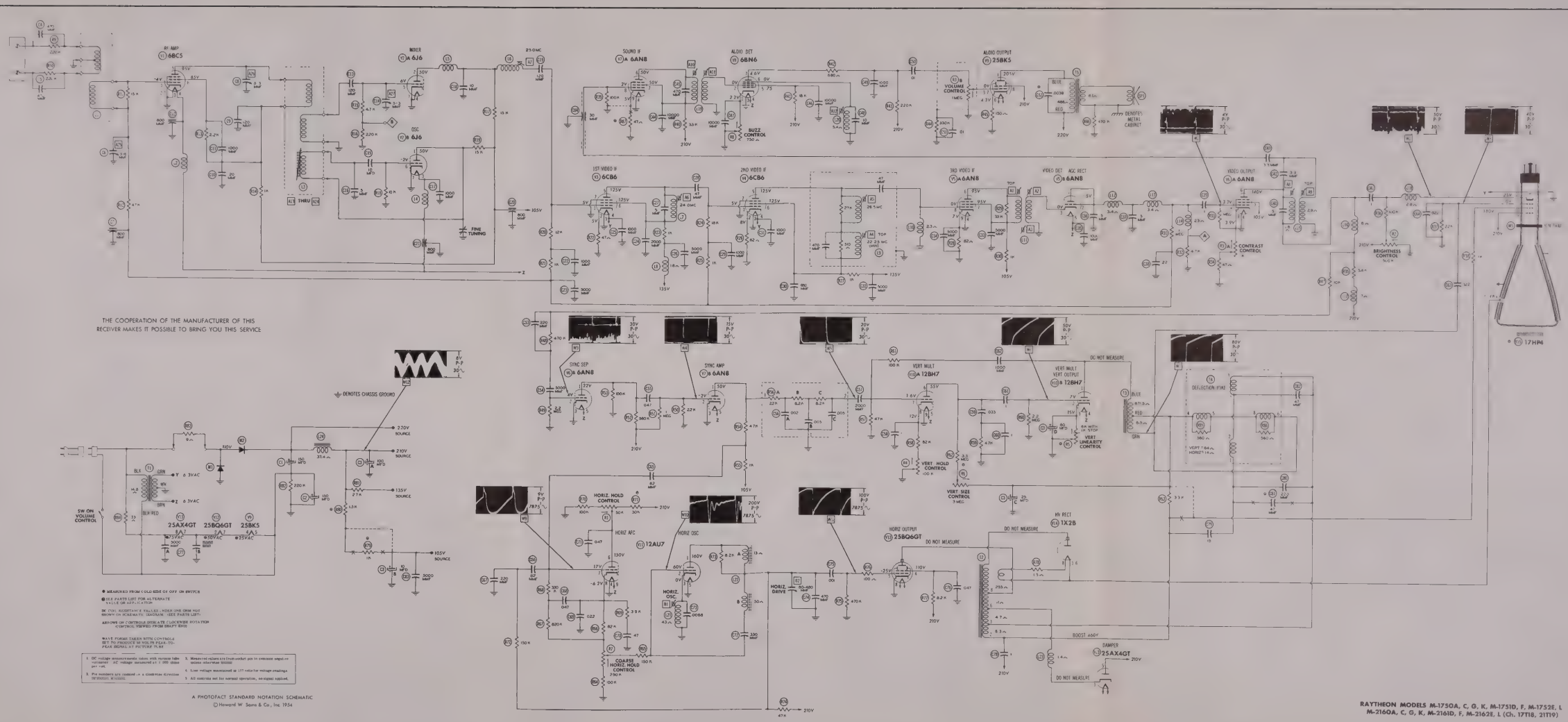

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CHASSIS TOP VIEW

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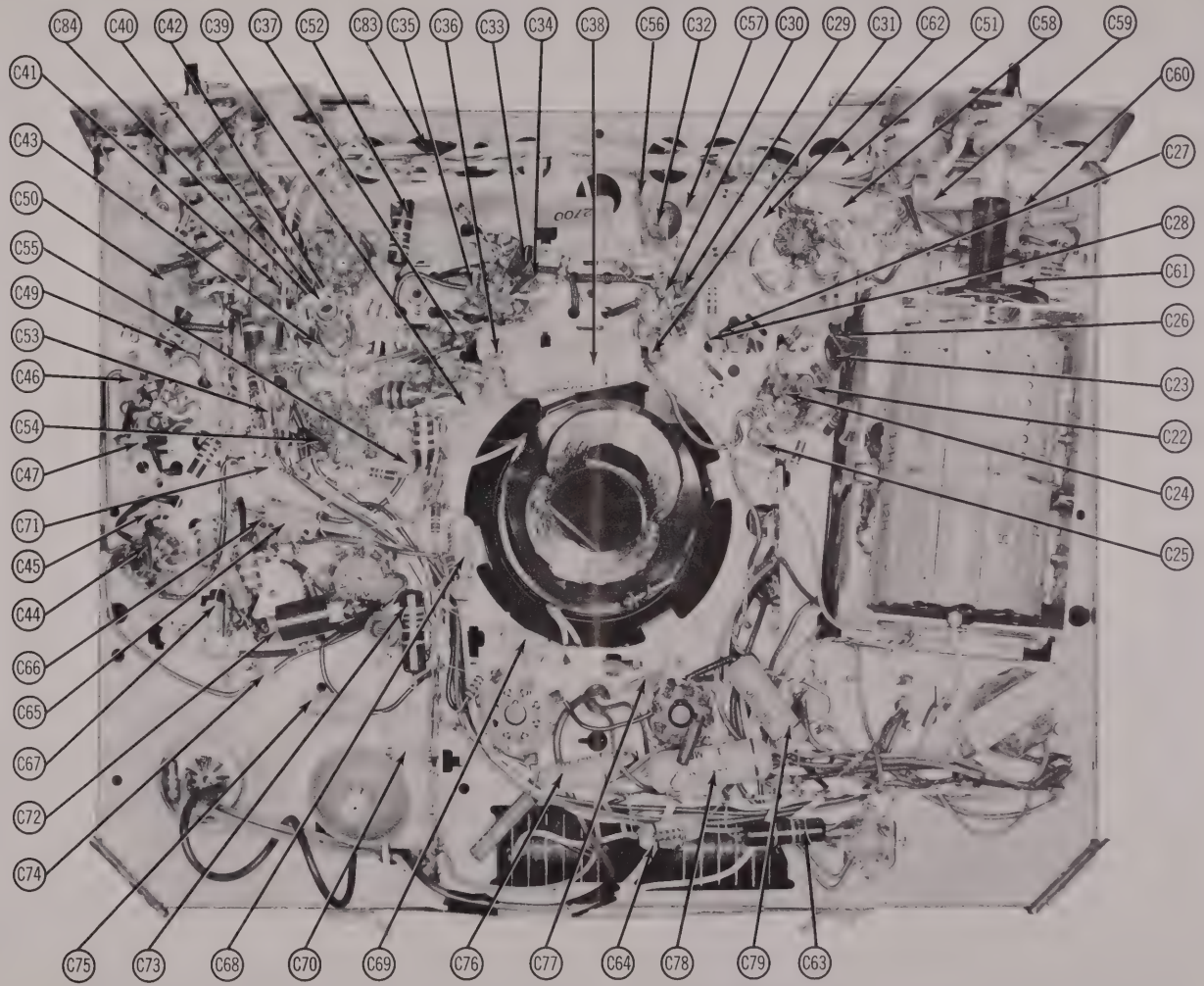

CHASSIS BOTTOM VIEW-CAPACITOR IDENTIFICATION

TUBE PLACEMENT CHART

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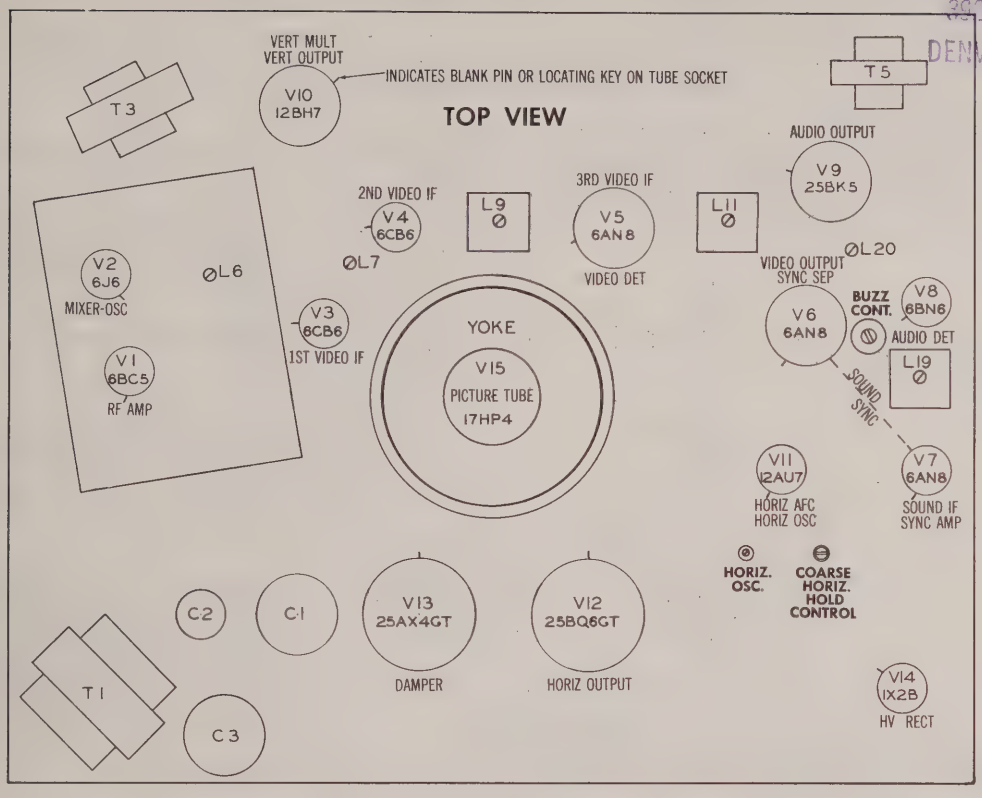


TUBE FAILURE CHECK CHART

The following chart lists tubes whose failures are most likely to produce the indicated symptoms. Refer to tube placement chart for location and type of tube.

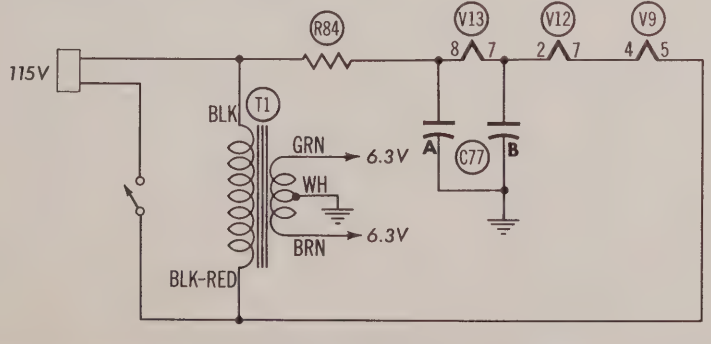
POWER SUPPLY FAILURE
No raster, no sound - Selenium Rectifiers (M1 & M2)

LOSS OF PICTURE OR SOUND
No pic, no sound, has raster - V2, V3, V4, V5, V6
No pic, no sound, has snow - V1, V2, V3
No pic, has sound, has raster - V15
Has pic, no sound - V7, V8, V9

SYNC FAILURE
No vert. sync - V7, V10
No horiz. sync - V7, V11
No vert. or horiz. sync - V6, V7

SWEEP FAILURE
No raster, has sound - V11, V12, V13, V14, V15
No vertical deflection - V10
Poor vert. linearity or foldover - V10
Poor horiz. linearity or foldover - V11, V12, V13
Narrow picture - V11, V12, V13, V14, M1, M2
Vert. off freq. - V7, V10
Horiz. off freq. - V7, V11

NOTE: Since this receiver employs tubes used in series-parallel filament network, an open filament in any tube in series may cause the set to be inoperative. (See circuit below).



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ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Use an isolation transformer to protect the test equipment.
The high voltage lead should be securely taped and kept away from the chassis. Do not remove the horizontal oscillator tube (V11) to disable the high voltage.

VIDEO IF ALIGNMENT

Remove the converter tube (V2) and replace with a 6J6 which has pin 1 removed. This will disable the local oscillator and reduce the possibility of erroneous indications.
Connect a .001MFD capacitor across the vertical input terminals of oscilloscope.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	.001MFD	High side to pin 8 (grid) of 6AN8 (V5). Low side to chassis.	25MC (10MC Swp)	23.9MC 26.3MC	Any	Vert. amp. thru 10KΩ to point (A). Low side to chassis.	A1 A2 A3	Connect a short jumper from pin 5 (plate) to pin 6 (screen) of 6CB6 (V4). Adjust for response similar to Fig. 1 with markers at 90%. A3 is a coupling rod and affects band width. Remove short from pin 5 to pin 6 of V4.
2.	Direct	High side to an ungrounded tube shield floating over dummy converter tube. Low side to chassis.	Not used	22.25MC (Unmod.)	"	Use VTVM DC probe to point (A). Common to chassis.	A4	Adjust for minimum deflection.
3.	"	"	"	26.5MC	"	"	A5	Adjust for maximum deflection. Attenuate generator output to maintain not more than 2 volts at VTVM. Repeat step 2.
4.	"	"	"	24.0MC	"	"	A6	Adjust for maximum deflection. Attenuate generator output to maintain not more than 2 volts at VTVM.
5.	"	"	"	25.0MC	"	"	A7	"
6.	"	"	25MC (10MC Swp)	21.3MC 23.8MC 26.65MC	"	Vert. amp. thru 10KΩ to point (A). Low side to chassis.		Check for response curve similar to Fig. 2. Rock A7 for flat response. Increase sweep generator output and use high scope gain to view 22.25MC trap region. Adjust A4 so that 21.3MC occurs at peak of pop-up portion preceeding trap notch. 22.25MC should fall in trap notch. If response obtain is not similar to Fig. 2, repeat steps 1 thru 6.

SOUND IF ALIGNMENT

Remove the dummy converter tube and replace the original 6J6 in its socket.
Tune in a TV signal and adjust the fine tuning control until spund bars just appear in the picture. Adjust A8 fully counter clockwise, then clockwise until the horizontal scanning lines are smooth and continuous. Readjust the fine tuning control for clearest picture and best sound.
Insert an attenuator in series with the antenna and the receiver antenna terminals so that the signal strength may be varied from weak to strong. If a suitable attenuator is not available stray feed the signal to the receiver by placing the antenna lead-in near the antenna terminals.
Reduce the signal input to the receiver so that the signal falls below the limiting level of the 6BN6 limiter-detector as evidenced by a "hiss" in the sound. Adjust the secondary of the sound take-off transformer (A9), the sound IF transformer (A10 and A11), the quadrature coil (A12) and the buzz control(R8) for maximum sound and minimum buzz. If hiss disappears while adjusting increase attenuation until hiss reappears.

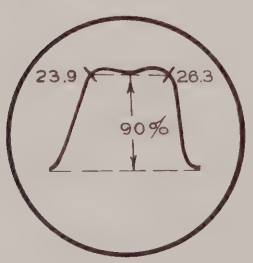

FIG. 1

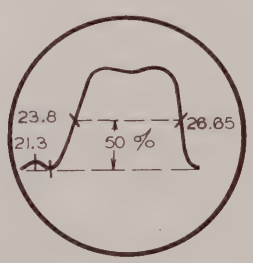

FIG. 2

ALIGNMENT INSTRUCTIONS (cont)

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OSCILLATOR ALIGNMENT

The channel oscillator adjustment screws are reached thru a hole just to the left of the fine tuning shaft. The correct oscillator adjustment screw is accessible thru this hole as the channel switch is turned to each channel. Connect the negative lead of a 1.5 volt bias battery to the ungrounded side of C38.
Connect the positive side to chassis.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Set the fine tuning control to the mid-position of its range.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
7.	Two 120Ω carbon resistors.	Across antenna terminals with 120Ω in each lead.	195MC (10MC Swp)	193. 25MC 197. 75MC	10	Vert. amp. thru 10KΩ to point Ⓐ . Low side to chassis.	A13	Adjust to place sound marker in trap notch as in Fig. 3. Use high scope gain and increase sweep generator output to view trap region. Video marker should fall at 50% on response curve.
			213MC (10MC Swp)	211. 25MC 215. 75MC	13		A14	
			207MC (10MC Swp)	205. 25MC 209. 75MC	12		A15	
			201MC (10MC Swp)	199. 25MC 203. 75MC	11		A16	
			189MC (10MC Swp)	187. 25MC 191. 75MC	9		A17	
			183MC (10MC Swp)	181. 25MC 185. 75MC	8		A18	
			177MC (10MC Swp)	175. 25MC 179. 75MC	7		A19	
			85MC (10MC Swp)	83. 25MC 87. 75MC	6		A20	
			79MC (10MC Swp)	77. 25MC 81. 75MC	5		A21	
			69MC (10MC Swp)	67. 25MC 71. 75MC	4		A22	
			63MC (10MC Swp)	61. 25MC 65. 75MC	3		A23	
			57MC (10MC Swp)	55. 25MC 59. 75MC	2		A24	

RF AND MIXER ALIGNMENT

Leave the bias battery connected as under "Oscillator Alignment".
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
8.	Two 120Ω carbon resistors.	Across antenna terminals with 120Ω in each lead.	195MC (10MC Swp)	193. 25MC 197. 75MC	10	Vert. amp. thru 10KΩ to point Ⓑ . Low side to chassis.	A25, A26, A27	Adjust for response curve similar to Fig. 4 with markers above 90%.
9.	"	"	69MC (10MC Swp)	67. 25MC 71. 75MC	4	"		Check for response curve similar to Fig. 4. If markers fall below 70% on any channel, make slight compromise adjustments of A25, A26 and A27 with channel switch set to that channel. Recheck all other channels to see that they have not been seriously affected.
			213MC (10MC Swp)	211. 25MC 215. 75MC	13			
			207MC (10MC Swp)	205. 25MC 209. 75MC	12			
			201MC (10MC Swp)	199. 25MC 203. 75MC	11			
			189MC (10MC Swp)	187. 25MC 191. 75MC	9			
			183MC (10MC Swp)	181. 25MC 185. 75MC	8			
			177MC (10MC Swp)	175. 25MC 179. 75MC	7			
			85MC (10MC Swp)	83. 25MC 87. 75MC	6			
			79MC (10MC Swp)	77. 25MC 81. 75MC	5			
			63MC (10MC Swp)	61. 25MC 65. 75MC	3			
			57MC (10MC Swp)	55. 25MC 59. 75MC	2			

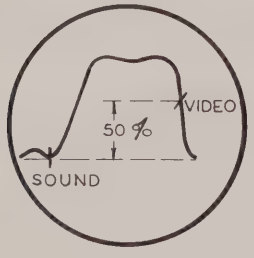


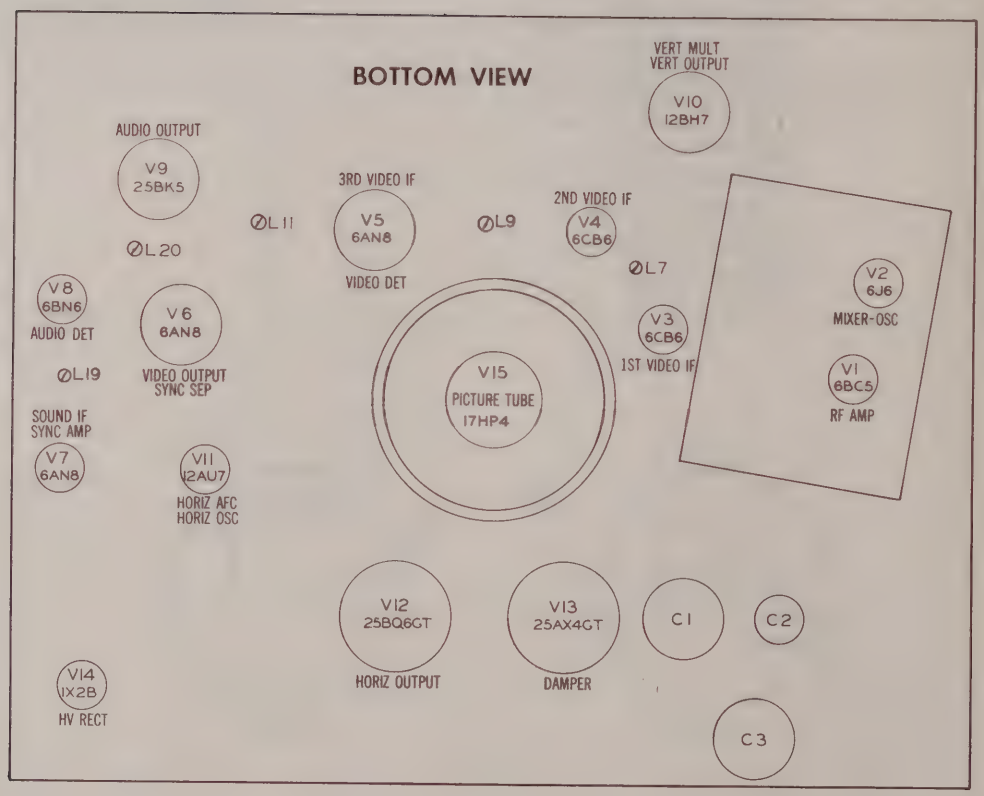
FIG. 3

FIG. 4

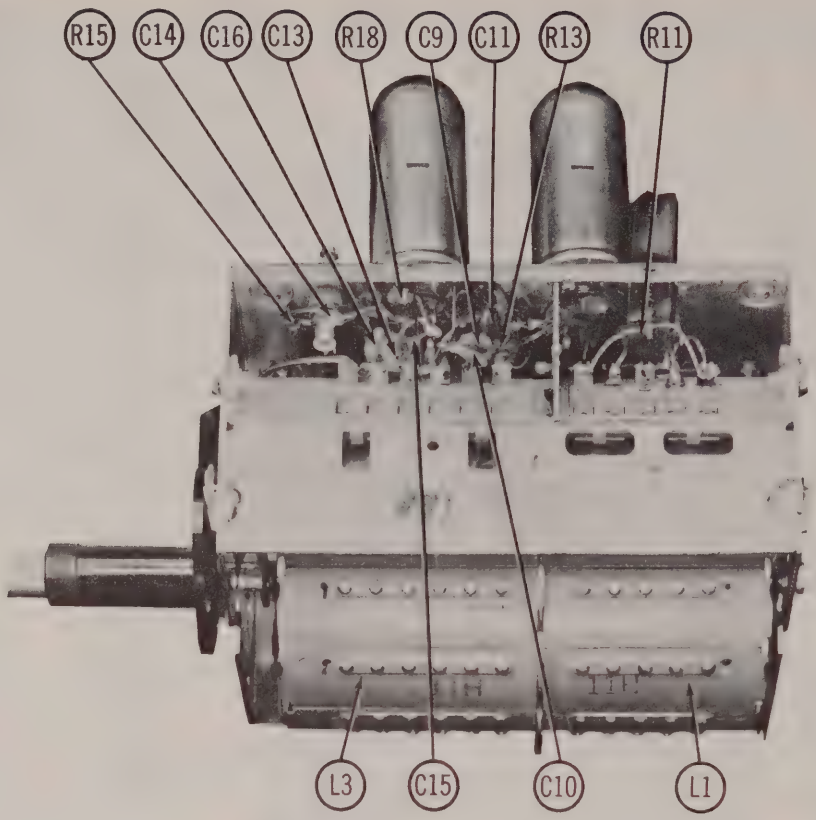
RESISTANCE MEASUREMENTS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6BC5	1Meg	0Ω	0Ω	.1Ω	†3.5KΩ	†5.5KΩ	0Ω		
V 2	6J6	†17.5KΩ	†17.5KΩ	.1Ω	0Ω	225KΩ	10KΩ	0Ω		
V 3	6CB6	1Meg	47Ω	0Ω	.1Ω	†3.7KΩ	†3.7KΩ	0Ω		
V 4	6CB6	1Meg	62Ω	0Ω	.1Ω	†3.7KΩ	†3.7KΩ	0Ω		
V 5	6AN8	4.7KΩ	4.7KΩ	.2Ω	0Ω	.1Ω	†3.5KΩ	†3.5KΩ	2.3Ω	82Ω
V 6	6AN8	†120KΩ	2.2Meg	0Ω	0Ω	.1Ω	†5.6KΩ	†2.5KΩ	1Meg	300Ω
V 7	6AN8	†8.2KΩ	22KΩ	0Ω	0Ω	.1Ω	†33KΩ	†33KΩ	100KΩ	47Ω
V 8	6BN6	300Ω	.3Ω	0Ω	.1Ω	†18KΩ	5.4Ω	†220KΩ		
V 9	25BK5	†485Ω	INF	120KΩ	■22Ω	■0Ω	150Ω	120KΩ	†37Ω	INF
V 10	12BH7	▲4.5KΩ	2.2Meg	1KΩ	.1Ω	.1Ω	▲4.5Meg	47KΩ	120KΩ	0Ω
V 11	12AU7	†47KΩ	500KΩ	43Ω	0Ω	0Ω	†30KΩ	1.5Meg	400KΩ	.1Ω
V 12	25BQ6GT	INF	■39Ω	INF	†8.2KΩ	470KΩ	INF	■22Ω	0Ω	Top Cap ▲12Ω
V 13	25AX4GT	▲20Ω	INF	1Meg	INF	†37Ω	INF	■39Ω	■50Ω	
V 14	1X2B	PINS 1-8 HAVE INFINITE RESISTANCE								Top Cap ▲265Ω
V 15	17HP4	0Ω	22KΩ	Pin 6 †37Ω	Pin 10 ▲1KΩ	Pin 11 †100KΩ	Pin 12 .1Ω			

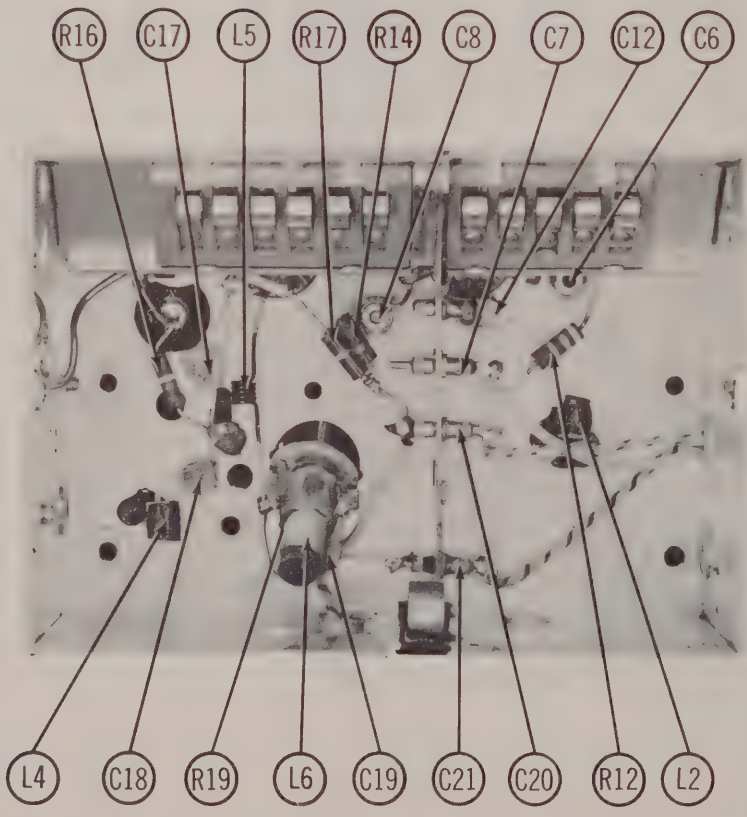
† MEASURED FROM OUTPUT OF M2.
▲ MEASURED FROM PIN 3 OF V13.
■ MEASURED FROM COLD SIDE OF OFF/ON SWITCH.



TUBE PLACEMENT CHART



RF TUNER-RIGHT SIDE



RF TUNER-BOTTOM VIEW

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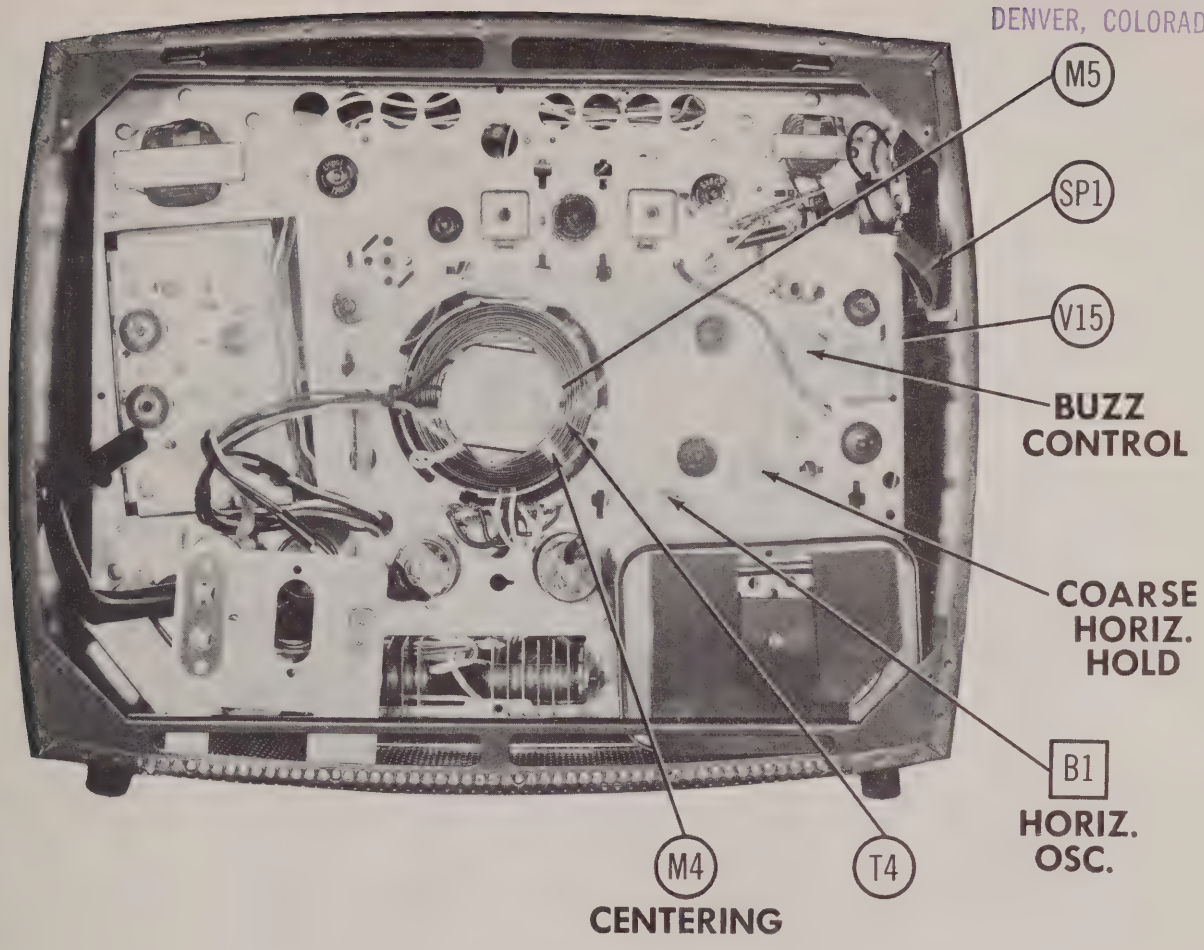

CABINET—REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Turn the set on and tune in a TV station, preferably a test pattern.

1. Set the horizontal hold control to its mid-range position and adjust the coarse horizontal hold control (R7A) for a steady picture.

2. Turn the horizontal hold control fully clockwise then fully counter clockwise noting the number of diagonal bars present on the screen. Adjust R7A until an equal number of diagonal bars are present on the screen at the extreme settings of the horizontal hold control. If this condition cannot be obtained proceed with step 3.

3. Turn the horizontal hold control fully counter clockwise. Turn R7A fully clockwise. Turn the horizontal oscillator coil slug (B1) counter clockwise until a squegging condition (breakup of raster) appears. Turn B1 clockwise until squegging stops. Turn B1 an additional two turns in a clockwise direction.

4. Set horizontal hold control and R7A to their mid-range positions and adjust B2 until picture synchronizes horizontally. Recheck holding action as in 1. and 2. above.

TROUBLE SHOOTING AIDS

SWEEP

HORIZONTAL

LOSS OF SWEEP

Follow procedure outlined under "Loss of High Voltage".

INSUFFICIENT SWEEP

Check by substitution V12 and V13. Check M1 and M2. Check T2, T4A, R77, C76 and other associated components.

DRIVE LINES

Check by substitution V12 and V13. Check adjustment B2. Check T2, T4A, C75, C74, R77 and other associated components.

COMPRESSED LEFT SIDE

Check by substitution V12 and V13. Check horizontal output and damper stages for component failure or change of value.

FOLDS

Follow procedure outlined under "Drive Lines".

PIE CRUST EFFECT

Check by substitution V11, V12 and V13. Check C69 for open. Check L21, C73, R70 and other associated components.

XMAS TREE EFFECT

Check by substitution V11, V12 and V13. Check T2 and T4A for internal arcing. Check L21, L22, C73, C72, C71, R71, R73 and other associated components.

VERTICAL

LOSS OF SWEEP

Substitute V10. Check waveform W6.

If Satisfactory	If Unsatisfactory
Check T3, T4B, R63, C3C, and other associated components.	Check C61, C59, R62, R6 and other associated components.

INSUFFICIENT SWEEP

Substitute V10. Check vertical size and vertical linearity controls for proper operation. Check T3 and T4B.

COMPRESSED AT BOTTOM

Substitute V10. Check R6, R62, R59, C59 and other associated components.

COMPRESSED AT TOP

Substitute V10. Check R5, C3D, T3, T4B and other associated components.

FOLDS

Substitute V10. Check C59, C60, R59, R5 and other associated components.

SYNC

LOSS OF VERTICAL AND HORIZONTAL SYNC

Check by substitution V6 and V7. Check C53, C54, C55, R52, R55, R54 and other associated components.

LOSS OF VERTICAL SYNC - HORIZONTAL SYNC SATISFACTORY

Substitute V10. Check C57, C58, R4 and R58. Check vertical integrator network. Check video IF alignment for overloading.

LOSS OF HORIZONTAL SYNC - VERTICAL SYNC SATISFACTORY

Substitute V11. Check C65, C68, C71, R70, R1 and other associated components.

HORIZONTAL BENDING

Check by substitution V6, V7 and V11. Check AFC network.

VIDEO

LOSS OF VIDEO

Substitute V6. Check C40, C41, L17, L16, R35 and other components associated with V6.

SOUND BARS (4.5MC BEAT)

Adjust tuner fine tuning for best sound and picture. Check video IF alignment.

POOR CONTRAST

Substitute V6. Check picture tube, contrast control, L14, R34 and other associated components.

NEGATIVE PICTURE

Substitute V6. Check video detector network, picture tube, C41 and other associated components.

SMEAR

Substitute V6. Check L17, L13, L12, C41, R35 and other associated components.

WIDE BLACK BAR ACROSS PICTURE

Check by substitution V3, V4, V5 and V6 for heater to cathode leakage.

AUDIO

WEAK OR NO SOUND

Check by substitution V7, V8 and V9. Check stage V10 using audio signal generator. Apply audio signal across R3B.

If Satisfactory	If Unsatisfactory
Check audio IF and audio detector stages for component failure or change of value.	Check C50, C52, R45, T5, speaker and other associated components.

BUZZ

Adjust tuner fine tuning for best sound and picture. Check adjustments R8 and A12. If still unsatisfactory, check audio IF alignment.

DISTORTED

Follow procedure outlined under "Weak or No Sound".

POWER

DEAD SET

If filaments fail to light, check AC interlock assembly. Check switch on volume control T1 and R84. Tubes V9, V12 and V13 filaments are connected in series. V9, V12 and V13 will fail to light if anyone of the filaments are open. If filaments light, check M1 and M2. Check B+ filter and decoupling network.

SMALL AND/OR DIM PICTURE

Check M1, M2, R84 and R83. Check B+ filter and decoupling network.

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CHASSIS BOTTOM VIEW-TRANS., INDUCTOR AND ALIGNMENT IDENTIFICATION

RAYTHEON MODELS M-1750A, C, G, K, M-1751D, F, M-1752E, L,
M-2160A, C, G, K, M-2161D, F, M-2162E, L (Ch. 17T18, 21T19)

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PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA, GENERAL ELECTRIC, WESTINGHOUSE)

ITEM No.	USE	REPLACEMENT DATA: RAYTHEON PART No.	STANDARD REPLACEMENT	RETMA BASE TYPE	NOTES
V1	RF Amp.	6BC5	6BC5	7BD	
V2	Mixer Osc.	6J6	6J6	7BF	
V3	1st Video IF Amp.	6CB6	6CB6	7CM	
V4	2nd Video IF Amp.	6CB6	6CB6	7CM	
V5	3rd. Video IF Amplifier - Video Detector	6AN8	6AN8	9DA	
V6	Video Output - Sync Sep	6AN8	6AN8	9DA	
V7	Sound IF Amp.- Sync Amp.	6AN8	6AN8	9DA	
V8	Audio Output	25BK5	25BK5	9BQ	
V9	Audio Output	25BX5	25BK5	9BQ	
V10	Vert Mult - Ver t Output	12BH7	12BH7	8A	
V11	Horiz AFC - Horiz Osc.	12AU7	12AU7	8A	
V12	Horiz Output	25BQ6GT	25BQ6GT	6AM	
V13	Damper	25AX4GT	25AX4GT	4CG	
V14	HV Rectifier	1X2B	1X2B	0Y	

CATHODE-RAY TUBE

ITEM No.	REPLACEMENT DATA: RAYTHEON PART No.	CBS HYTRON PART No.	GENERAL ELECTRIC PART No.	SYLVANIA PART No.	WESTINGHOUSE PART No	RETMA BASE TYPE	NOTES
V15	17HP4	17HP4	17HP4	17HP4 17HP4	17HP4	12L	↑ Circuit changes necessary.
	21YP4	21YP4	21YP4	21YP4 21YP4A 21AP4A ↓	21YP4	12L 12L 12M	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: RAYTHEON PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C1	150	150	8C-22404	AFHSI-70		XA004		FPU7	TVL-3442	
C2	150	150	8C-22483	AFHSI-70		XA004		FPU7	TVL-3442	
C3A	▣100	300	8C-23689	{ AFHS-26				FP389-1	TVL-3574	
B	±10	300		PRS450/20		HR505		TC39	TVA-1711	
C	▣25	450								
D	80	50								
C4	470	500	8P3-121	1488-471	D8-471	5WS747	GP3K-471	MC345	1FM-35	
C5	470	500	8P3-121	1488-471	D8-471	5WS747	GP3K-471	MC345	1FM-35	
C6	3-8		31A-079		839-10					
C7	800		13M102Z02	KY-801	MFT-1000				503C-D1	
C8	3-8		31A-068-1		829-3		3115-01-GR5	CT565A		
C9	120		13LSD121K	BPD-00012	D6-121	G044	GP2K-121	UC-5312	5GA-T12	
C10	120		13LSD121K	BPD-00012	D6-121	G044	GP2K-121	UC-5312	5GA-T12	
C11	1000		13LSY102Z	BPD-001	DD-102	K089	801-001	DC-581	5HK-D1	
C12	800		13M102Z02	EF-001	MFT-1000				503C-D1	
C13	120		13LSD121K	BPD-00012	D6-121	G044	GP2K-121	UC-5312	5GA-T12	
C14	3-8		31A-068-1		829-3		3115-01-GR5	CT565A		
C15	10		13LSC100A	SI10NT50	TCN-10	N01E	NT50K-100	NT-541	5TCU-Q1	
C16	5		13LSU05QC	SI5NP0	TCZ-4.7	Z01C	MP0K-050	ZT-555	5TCCB-V47	
C17	1000		13LSY102Z	BPD-001	DD-103	K089	801-001	DC-521	5HK-D1	
C18	10		13LSC100A	SI10NT0	TCZ-10	Z03E	NP0K-100	ZT-541	5TCC-Q1	
C19	120		13LSD121K	BPD-00012	D6-121	G044	GP2K-121	UC-5312	5GA-T12	
C20	800		13M102Z2	EF-001	MFT-1000				503C-D1	
C21	800		13M102Z2	EF-001	MFT-1000				503C-D1	
C22	1000		SC-13501	SI1000	D6-102	TP52	GP2L-102	UC-521	5HK-D1	
C23	5000		SC-13502	SI2000	BPD-005	D0-502	K080	DC-525	5HK-D5	
C24	2000		SC-13523	SI2000	D6-202	TP56	GP2-333-202	UC-523	5HK-D2	
C25	1000		SC-13201	SI1000	D6-102	TP52	GP2L-102	UC-521	5HK-D1	
C26	5000		SC-13502	SI2000	BPD-005	D0-502	K080	DC-525	5HK-D5	
C27	5		SC-12166	SI5NP0	TCZ-4.7	TZ07	NP0K-050	ZT-555	5TCCB-V47	
C28	47		SC-13731	SI47NP0	TCZ-47	TZ33	NP0K-470	ZT-5447	5TCC-Q47	
C29	1000		SC-13201	SI1000	D6-102	TP52	GP2L-102	UC-521	5HK-D1	
C30	680		SC-21205	SI680	D6-681	TP50	GP2K-681	UC-5388	5GA-T68	
C31	1000		SC-13201	SI1000	D6-102	TP52	GP2L-102	UC-521	5HK-D1	
C32	5000		SC-13502	BPD-005	DD-502	K080	801-005	DC-525	5HK-D5	
C33	5000		SC-13502	BPD-005	DD-502	K080	801-005	DC-525	5HK-D5	
C34	5000		SC-13502	BPD-005	DD-502	K080	801-005	DC-525	5HK-D5	
C35	1000		SC-13201	SI1000	D6-102	TP52	GP2L-102	UC-521	5HK-D1	
C36	5		SC-12166	SI5NP0	TCZ-4.7	TZ07	NP0K-050	ZT-555	5TCCB-V47	
C37	5		SC-12166	SI5NP0	TCZ-4.7	TZ07	NP0K-050	ZT-555	5TCCB-V47	
C38	.22	300	SC-23086	P288-22		CUB2P22		PT4022	2TM-P22	
C39	.01	400	SC-23084	P288-1	DF-104	CUB2P1		PT401	2TM-P1	
C40	51		SC-23725	151N750	TCN-51	TN15	N750L-510			
C41	.1	400	SC-23095	P488-1	DF-104	CUB4P1		PT401	4TM-P1	
C42	3.3		SC-23751	813.3NP0	TCZ-3.3	TZ06	NP0K-3R3	ZT-5533	5TCCB-V33	
C43	33		SC-19503	SI33NP0	TCZ-33	TZ18	NP0K-330	ZT-5433	5TCC-Q33	
C44	10000		SC-20269	BPD-01	DD-103	K083	81-01	DC-511	5HK-S1	
C45	470	500	8P2-121	1488-471		5RS747		MCB245	MS-35	
C46	10000		SC-20269	BPD-01	DD-103	K083	81-01	DC-511	5HK-S1	
C47	10000		SC-20269	BPD-01	DD-103	K083	81-01	DC-511	5HK-S1	
C48	10		SC-11759	SI10NP0	TCZ-10	TZ09	NP0K-100	ZT-541	5TCC-Q1	
C49	1000		SC-13201	SI1000	D6-102	TP52	GP2L-102	UC-521	5HK-D1	
C50	.01	400	SC-20269	P488-01	D6-103	CUB4P1	GP2-333-103	PT401	4TM-S1	
C51	.01	400	SK-23091	P488-01	D6-103	CUB4P1	GP2-333-103	PT401	4TM-S1	
C52	.0039	600		P888-004	D6-402	CUB6D4	GP2-333-402	PT634	6TM-D4	Note 1
C53	220		SC-19985	SI220	D6-221	TP29	GP3K-221	UC-5323	5GA-T22	
C54	1000		SC-13201	BPD-005	DD-502	K080	801-005	DC-525	5HK-D5	
C55	.047	200	SK-23083	P288-047	DF-503	CUB2S47		PT4147	2TM-S47	
C56A	.002							PT632	6TM-D2	
B	.005		▲TA-23278	▲PA-110	▲PC-100	▲115TM1	▲1405-01	PT635	6TM-D5	
C	.005							PT635	6TM-D5	
C57	1000		SC-19533	SI2000	D6-202	TP56	GP2-333-202	UC-523	5HK-D2	
C58	.1	200	SK-23084	P288-1	DF-104	CUB2P1		PT401	2TM-P1	
C59	.033	400	SK-23816	P488-033		PM4S33		PT4133		

CAPACITORS (cont)

ITEM No.	RATING: CAP	RATING: VOLT	REPLACEMENT DATA: RAYTHEON PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C60	.1	200	SK-23084	P288-1	DF-104	CUB2P1		PT401	2TM-P1	
C61	.1	400	SC-23095	P488-1	DF-104	CUB4P1		PT401	4TM-P1	
C62	1000	1000	SC-23781	HVD30-001	DD30-402		3KV-102		2SGA-D1	
C63	.022	400	SK-23093	P488-022	DF-203	CUB4S22	817-02	PT4122	4TM-S22	
C64	.022	200	SK-23082	P288-022	DF-203	CUB2S22	817-02	PT4122	4TM-S22	
C65	82	500	8P3-122	1469-820		22R5Q82				
C66	82	500	8P3-122	1469-820		22R5Q82				
C67	220	500	8P3-127	1469-221		22R5T22		MCB240		
C68	.047	200	SK-23083	P288-047	DF-503	CUB2S47		PT4147	2TM-S47	
C69	.022	300	SK-23085	P488-022	DF-203	CUB4S22	817-02	PT4122	4TM-S22	
C70	.47	200	SK-23087	P288-47		CUB2S47		PT4047	2TM-S47	
C71	.047	400	SC-23094	P488-047	DF-503	CUB4S47		PT4147	4TM-S47	
C72	330	500	8P3-119	1469-331		5R6T33				
C73	.0068	600	SM-24087							
C74	470		8D-23778	BPD-00047	D6-471		K080	801-471	UC-5347	5GA-T47
C75	.001	600	SK-23099	P688-001	D6-102		CUB6D1	GP2L-102	PT631	6TM-D1
C76	.047	400	SK-23094	P488-047	DF-503		CUB4S47		PT4147	4TM-S47
C77A	5000		▣3-23780	BPD-2X0047	DD5-502		DK079	{ 5U-005	DC-535	5HK-D47
B	5000							5U-005	DC-535	
C78	.1	600	SK-23095	P888-1			CUB6P1		PT801	6TM-P1
C79	.15	200	SK-23085	P288-15			CUB2P15		PT4015	2TM-P15
C80	330	3000	SG-23553	HVD30-00022	DD30-231			3KV-231		3GA-T22
C81	47	3000	SG-24026	HVD30-000047	DD30-470			3KV-470		3GA-Q47
C82	47	3000	SG-23549	HVD30-000047	DD30-470			3KV-470	MCL-447	3GA-Q47
C83	5000		SG-13563	BPD-005	DD-502		K080	5U-005	DC-535	5HK-D5
C84	30		16B-23772							

Note 1. Some versions use .01MFD in this application (part #8K-23102).
Note 2. Not used in all versions.
♦Items C58A, C58B, C58C, R56A, R56B, R56C are combined in one unit.

CONTROLS

ITEM No.	RATING: RESIST-ANCE	RATING: WATTS	REPLACEMENT DATA: RAYTHEON PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	50KΩ	½	B-10B-23094	Q11-123	A47-50K-S	AB-31	U-35	Horiz. Hold
B	Shaft		Not Req.	Not Req.	KS6-3	AK-4	Not Req.	Attach to R1A
R2A	500KΩ	½	B-10B-23695	Q11-133	A47-500K-S	AB-59	U-50	Brightness
B	Shaft		Not Req.	Not Req.	KS6-3	AK-4	Not Req.	Attach to R2A
R3A	100KΩ	▣	D10A-23714	RQ	RTV-486	F1-4	U-13A]	Contrast-Pixel
B	1Meg	‡			Not Req.	R2-52	U-13A] †	Volume-Rear
C	Switch				Not Req.	KB-1	U3-38	Attach to R3B
R4A	100KΩ	½	B-10B-23693	Q11-128	A47-100K-S	AB-40	U-41	Vert. Hold
B	Shaft		Not Req.	Not Req.	KS6-3	AK-4	Not Req.	Attach to R4A
R5A	50000Ω with 10000Ω stop.	½	B-10B-23407	Q11-114	A47-5000-S	AB-10	SU-14	Vert. Linearity - Note 1
B	Shaft		Not Req.	RQ	FKS-1/4	AK-1	Not Req.	Attach to R5A
R6A	3Meg	‡	B-10B-23696	Q11-140	A47-3Meg-S	AB-94	SU-59	Vert. size
B	Shaft		Not Req.	RQ	FKS-1/4	AK-1	Not Req.	Attach to R6A
R7A	250KΩ	½	B-10B-23656	Q11-130	A47-250K-S	AB-50	SU-48	Coarse Horiz. Hold
B	Shaft		Not Req.	RQ	FKS-1/4	AK-1	Not Req.	Attach to R7A
R8	1	½	A-100-23857		39-750			Buzz Wire Wound

Note 1. Connect a 10000 resistor in series with the right hand terminal of the control and the lead connecting to the same terminal of the original control (control viewed from shaft end, terminals down).
† Universal replacement (Mallory exact duplicate part no. UE-080).

RESISTORS

ITEM No.	RATING: OHMS	RATING: WATT	REPLACEMENT DATA: RAYTHEON PART No.	IRC PART No.	NOTES
R9	220KΩ	½	9B1-37	BTS-220K	
R10	220KΩ	½	9B1-37	BTS-220K	
R11	15KΩ	½		BTS-15K	
R12	47KΩ	½		BTS-47K	
R13	2200Ω	½		BTS-2200	
R14	1000Ω	½		BTS-1000	
R15	4700Ω	½		BTS-4700	
R16	220KΩ	½		BTS-220K	
R17	15KΩ	½		BTS-15K	
R18	10KΩ	½		BTS-10K	
R19	15KΩ	½		BTS-15K	
R20	12KΩ	½	9B1-75	BTS-12K	
R21	1000Ω	½	9B1-63	BTS-1000	
R22	47Ω	½	9B1-46	BTS-47	
R23	2200Ω	½	9B1-63	BTS-2200	
R24	18KΩ	½	9B1-77	BTS-18K	
R25	1000Ω	½	9B1-63	BTS-1000	
R26	82Ω 5%	½	9B1-130	BTS-82 5%	
R27	1000Ω	½	9B1-63	BTS-1000	
R28	82Ω	½	9B1-49	BTS-82	
R29	33KΩ	½	9B1-80	BTS-33K	
R30	1000Ω	½	9B1-63	BTS-1000	
R31	1Meg	½	9B1-96	BTS-1Meg	
R32	4700Ω	2	5R5T47	BTB-4700	
R33	1Meg	½	9B1-96	BTS-1Meg	
R34	47Ω	½	9B1-46	BTS-47	
R35	200Ω	2	9B4-71		
R36	100KΩ	½	9B1-86	BTS-100K	
R37	22KΩ	½	9B1-78	BTS-22K	
R38	1000Ω	½	9B1-63	BTS-1000	
R39	100KΩ	½	9B1-86	BTS-100K	
R40	33KΩ	1	9B2-80	BTA-33K	
R41	18KΩ	½	9B4-77	BTB-18K	
R42	68Ω	½	9B1-60	BTS-680	
R43	220KΩ	½	9B1-90	BTS-220K	
R44	330KΩ	½	9B1-92	BTS-330K	
R45	150Ω	1	9B2-52	BTA-150	
R46	470KΩ	½	9B4-29	BTS-470K	

RESISTORS (cont)

ITEM No.	RATING: OHMS	RATING: WATT	REPLACEMENT DATA: RAYTHEON PART No.	IRC PART No.	NOTES
R47	10KΩ	½	9B1-74	BTS-10K	
R48	470KΩ	½	9B1-94	BTS-470K	
R49	2.2Meg	½	9B1-102	BTS-2.2Meg	
R50	22KΩ	2		BTS-22K	
R51	1Meg	½	9B1-98	BTS-1Meg	
R52	560KΩ	½	9B1-95	BTS-560K	
R53	100KΩ	½	9B1-86	BTS-100K	
R54	470Ω	1	9B1-66	BTA-470	
R55	100Ω	½	9B1-62	BTS-1000	
R56A	33KΩ	½		BTS-33K	
B	8200Ω	½	♦17A-23376	BTS-8200	
C	8200Ω	½		BTS-8200	
R57	47KΩ	2		BTB-47K	
R58	82KΩ	½	9B1-83	BTS-82K	
R59	4700Ω	½	9B1-70	BTS-4700	
R60	2.2Meg	½	9B1-102	BTS-2.2Meg	
R61	100KΩ	½	9B1-86	BTS-100K	
R62	2.2MΩ	½	9B1-102	BTS-2.2Meg	
R63	330Ω	½	9C12-1105		Note 4
R64	100KΩ	½	9B1-86	BTS-100K	
R65	150KΩ	½	9B1-88	BTS-150K	
R66	82KΩ	½	9B1-85	BTS-82K	
R67	820KΩ	½	9B1-97	BTS-820K	
R68	330KΩ	½	9B1-92	BTS-330K	
R69	390Ω	½	9B1-69	BTS-390	
R70	100KΩ	½	9B1-86	BTS-100K	
R71	30KΩ	1		BTS-30K	Note 1
R72	150KΩ	½		BTS-150K	
R73	8200Ω	½	9B1-73	BTS-8200	
R74	47KΩ	2	9B1-82	BTS-47K	
R75	470KΩ	½	9B1-94	BTS-470K	
R76	100Ω	½	9B1-50	BTS-100	
R77	8200Ω	2	9B4-73	BTB-8200	
R78	1.5Ω	½	9C1-1085		
R79	1000Ω	10		PW10-1000	Note 2
R80	1500Ω	10		PW10-1500	Note 3
R81	2700Ω	½	9C12-1104		
R82	330KΩ	½	9B1-27	BTS-220K	

RESISTORS (cont)

ITEM No.	RATING: OHMS	RATING: WATT	REPLACEMENT DATA: RAYTHEON PART No.	IRC PART No.	NOTES
R83	8Ω	5	48M-23018		
R84	133Ω	15	9C-23872		Note 2
R85	560Ω	½	9B1-59	BTS-560	
R86	560Ω	½	8B1-59	BTS-560	
R87	47Ω	½			

♦Items R56A, R56B, R56C, C56A, C56B and C56C are combined in one unit.
Note 1 Some models may use a 33KΩ resistor in this application.
Note 2. Not used in all versions
Note 3.Some versions may use a 2500Ω resistor in this application.
Note 4. Some versions may use a 2.2meg resistor in this application.

TRANSFORMER (FILAMENT)

ITEM No	RATING: PRI.	RATING: SEC. 1	RATING: SEC. 2	REPLACEMENT DATA: RAYTHEON PART No	Stancor PART No.	Merit PART No.	Triad PART No.	RCA TYPE No	Halldorson PART No	Thordarson PART No
T1	117VAC	12.6VCT		12D23699	P-8130					
	@.29A	@2.4A								

TRANSFORMERS (SWEEP CIRCUITS)

ITEM No.	USE	REPLACEMENT DATA: RAYTHEON PART No	Stancor PART No.	Merit PART No.	Triad PART No.	RCA TYPE No.	Halldorson PART No.	Thordarson PART No
T2	Horiz. Output Trans.	12E-23039						
T3	Vert. Output Trans.	12E-23726						
T4A	Yoke-Horiz. (DMH)	20-23744 ① ② ③	A-8123 ③	A-3097 MDF-70 ① ③	A-103X ③	T-12 ②	22FT1 20SDJ ② ③	21804 DF60 ② ③	26852 Y-5 ② ③
B	Vert. (42MH)								

① Includes deflection yoke part no. 13M-23755, C82, R85, R86.
② Use original yoke cover and positioning device.
③ Use original horiz. yoke network.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE: PRI.	IMPEDANCE: SEC.	REPLACEMENT DATA: RAYTHEON PART No.	Stancor PART No.	Merit PART No	Triad PART No.	Halldorson PART No	Thordarson PART No	NOTES
T5	6 4K	3 5Ω	12C-23704	A-3978 ①	A-3026	S-7X ①	21113 ①	22846	① Drill one new mounting hole.

SPEAKER

ITEM No.	RATINGS: SIZE	FIELD	V. C. IMP.	REPLACEMENT DATA: RAYTHEON PART No.	VIKING PART No.	QUAM PART No.	NOTES
SP1	4"	PM	2.5Ω	18A33735	426	4A07	
	8"	PM	2.5Ω	18A31216 ①	526	5A1	① Used in 21" Models.

COILS (RF-IF)

ITEM No.	USE	DC RES.: PRI.	DC RES.: SEC.	REPLACEMENT DATA: RAYTHEON PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	NOTES
L1A	Ant. Coil	00 CT	0Ω	31M-012-2H				Channel 2
B	Ant. Coil	00 CT	0Ω	31M-012-3H				Channel 3
C	Ant. Coil	00 CT	0Ω	31M-012-4H				Channel 4
D	Ani. Coil	00 CT	0Ω	31M-012-5H				Channel 5
E	Ani. Coil	00 CT	0Ω	31M-012-6H				Channel 6
F	Ani. Coil	00 CT	0Ω	31M-012-7H				Channel 7
G	Ant. Coil	00 CT	0Ω	31M-012-8H				Channel 8
H	Ant. Coil	00 CT	0Ω	31M-012-9H				Channel 9
I	Ant. Coil	00 CT	0Ω	31M-012-10H				Channel 10
J	Ant. Coil	00 CT	0Ω	31M-012-11H				Channel 11
K	Ant. Coil	00 CT	0Ω	31M-012-12H				Channel 12
L	Ant. Coil	00 CT	0Ω	31M-012-13H				Channel 13
L2	Fil. Choke	0Ω		36A-546				
L3A	RF, Mixer Grid, Osc. Coil	0Ω		31M-112-3H				Channel 2
B	RF, Mixer Grid, Osc. Coil	0Ω		31M-112-3H				Channel 3
C	RF, Mixer Grid, Osc. Coil	0Ω		31M-112-4H				Channel 4
D	RF, Mixer Grid, Osc. Coil	0Ω		31M-112-5H				Channel 5
E	RF, Mixer Grid, Osc. Coil	0Ω		31M-112-6H				Channel 6
F	RF, Mixer Grid, Osc. Coil	0Ω		31M-112-7H				Channel 7
G	RF, Mixer Grid, Osc. Coil	0Ω		31M-112-8H				Channel 8
H	RF, Mixer Grid, Osc. Coil	0Ω		31M-112-9H				Channel 9
I	RF, Mixer Grid, Osc. Coil	0Ω		31M-112-10H				Channel 10
J	RF, Mixer Grid, Osc. Coil	0Ω		31M-112-11H				Channel 11
K	RF, Mixer Grid, Osc. Coil	0Ω		31M-112-12H				Channel 12

(CONT'D ON NEXT PAGE)

PARTS LIST AND DESCRIPTIONS (Continued)

COILS (cont)

ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA: RAYTHEON PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	NOTES
L	RF, Mixer Grid, Osc. Coil	0Ω		31M-112-13H				Channel 13
L4	Fil. Choke	0Ω		34A-575				
L5	RF Choke	0Ω		31B-638-1				
L6	1st. Video IF	.9Ω		31B-257-8				
L7	2nd. Video IF	.1Ω		201-23829	17-1004 *	TV-103 ■	6189 ■	
L8	RF Choke	1.8Ω		16A-18676				2.2 Microhenries, IRC part #CLA
L9	3rd. Video IF			201-24043				Includes 27KΩ resistor, 510Ω resistor, 47MMF and 470MMF Cap.
L10	Shunt Peaking Coil	2.3Ω		201-20265	19-3036	TV-180	6176	38 Microhenries
L11	4th. Video IF	.2Ω	.2Ω	13B-23887	17-4524			
L12	Series Peaking Coil	3.4Ω		16A-22923	19-6022		6152	25 Microhenries
L13	Series Peaking Coil	3.4Ω		16A-22923	19-6022		6152	25 Microhenries
L14	Shunt Peaking Coil	23Ω		16A-19365	19-3500	TV-188	4648	470 Microhenries
L15	4.5MC Trap	1.8Ω	2.9Ω	201-23729				Includes a 51MMF, 3.3MMF and 33MMF Caps.
L16	Series Peaking Coil	8Ω		16A-21391	19-3300		6155	305 Microhenries
L17	Series Peaking Coil	7Ω		16A-20870	19-3250	TV-185	6181	270 Microhenries
L18	Series Peaking Coil	2.6Ω		16A-24090	19-1005		4612	11 Microhenries
L19	Sound IF	.3Ω	.3Ω	201-23873				
L20	Quadrature Coil	5.4Ω		201-23727	17-3400		1469	
L21	Ringing Coil	43Ω		13M-24085	19-1575 ▲		6314	
L22	Horiz. Osc.	63Ω		13M-24086				tapped @ 13Ω
L23	RF Choke	1.4Ω		16A-21701	19-1005		4612	8 Microhenries

* Parallel with 5MMF Capacitor.
■ Parallel with 5MMF capacitor and enlarge mounting hole.
▲ Change capacitor across coil to .01MFD.

FILTER CHOKE

ITEM No.	RATINGS: TOTAL DIRECT CURRENT	RATINGS: D. C. RESISTANCE	RATINGS: INDUCTANCE (0 CURRENT 1000 ~)	REPLACEMENT DATA: RAYTHEON PART No.	Stancor PART No.	Merit PART No.	Triad PART No.	Halldorson PART No.	Thordarson PART No.
L24	.220A	37.4Ω	.5 Hy.	16A-23889					

SELENIUM RECTIFIER

ITEM No.	RATING: CURRENT	REPLACEMENT DATA: RAYTHEON PART No.	FEDERAL PART No.	INTERNATIONAL PART No.	MALLORY PART No.	SARKES TARZIAN PART No.	SELETRON PART No.	NOTES
M1	.250A	21J23840	1236A	RS300	6S300	300	6Q4	
M2	.250A	21J23840	1236A	RS300	6S300	300	6Q4	

MISCELLANEOUS

ITEM No.	PART NAME	RAYTHEON PART No.	NOTES
M3	Tuner	211-23684	VHF
M4	Centering device	16M-23770	Includes yoke cover
M5	Ion trap	16M-19705	17" Picture Tube - Chassis 17T18
	Ion trap	16M-19706	21" Picture Tube - Chassis 21T19
B2	Trimmer Cap.	8E-18511	Horiz. Drive - (80-480MMF)
	Cabinet	200-23920	Model M-1750C
	Cabinet	200-23920-1	Model M-1750A
	Cabinet	200-23920-2	Model M-1750G
	Cabinet	200-23920-3	Model M-1750K
	Cabinet	200-23920-4	Model M-1751F
	Cabinet	200-23920-5	Model M-1751D
	Cabinet	200-23920-6	Model M-1752E
	Cabinet	200-23920-7	Model M-1752L
	Cabinet	200-23921	Model M-2160C
	Cabinet	200-23921-1	Model M-2160A
	Cabinet	200-23921-2	Model M-2160G
	Cabinet	200-23921-3	Model M-2160K
	Cabinet	200-23921-4	Model M-2161F
	Cabinet	200-23921-5	Model M-2161D
	Cabinet	200-23922-6	Models M-2162E, M-2162L
	Knob	5B-23789-A93	Channel Selector
	Knob	5B-23789-A93	Fine Tuning
	Knob	5B-23787-A93	Contrast
	Knob	5B-23786-A93	On-Off-Volume
	Knob	5B-23805-A93	Control (3 used)
	Disk	5M-23792-A93	Channel Indicator
	Disk	5M-23794-A93	Control Indicator
	Safety Glass	30M-18773	17" Picture Tube
	Safety Glass	30M-23709	21" Picture Tube

TROUBLE SHOOTING AIDS (cont)

PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO

HIGH VOLTAGE

LOSS OF HIGH VOLTAGE

Check by substitution V11, V12, V13 and V14. Check waveform W11.

If Satisfactory	If Unsatisfactory
Check T2, T4A, C80, C79, C81, C78, C76, R77 and other associated components.	Check L21, L22, C73, C72, R71, R73, R74 and other associated components.

INSUFFICIENT HIGH VOLTAGE

Check by substitution V12, V13 and V14. Check M1 and M2. Check C75, C74, R77 and other associated components.

BLOOMING

Check by substitution V12, V13 and V14. Check M1 and M2. Check R78, C78, C80, C75 and other associated components.

GENERAL

RASTER, SOUND, NO PICTURE

Follow procedure outlined under "Loss of Video".

RASTER, PICTURE, NO SOUND

Follow procedure outlined under "Weak or No Sound".

RASTER, NO SOUND, NO PICTURE

Check by substitution V1, V2, V3, V4, V5 and V6. Check video IF components for failure or change of value.

NO RASTER, NO SOUND

Follow procedure outlined under "Dead Set".

KEYSTONE EFFECT

Check T4 and its associated components.

INTERMITTENT STREAKS

Check high voltage section for corona discharge, and arcing.

Symptoms shown are assumed and are not indicative of the quality and workmanship of this equipment.

SERVICING IN THE FIELD

TUNER OSCILLATOR ADJUSTMENT

Touch-up adjustment of the VHF tuner oscillator circuit may be accomplished by removal of Channel Selector and fine tuning knobs. Remove 2 screws from escutcheon ring, remove ring . The adjustments are accessible one at a time through the small hole in the cabinet to the right of the channel selector shaft. Also, the vertical size and vertical linearity adjustments are accessible when the escutcheon ring is removed.

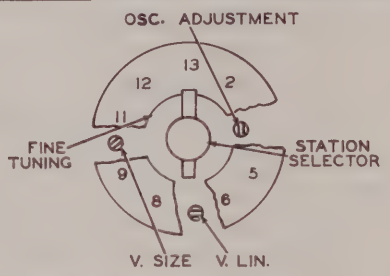
PICTURE TUBE SAFETY GLASS CLEANING

To clean safety glass, remove chassis. Remove 4 bolts from supporting brackets. Remove safety glass and frame.

PICTURE TUBE REMOVAL

For picture tube removal, remove chassis, safety glass and frame, tube socket, ion trap, H. V. lead. Remove picture tube.

SERVICE ADJUSTMENT LOCATION (ALSO SEE TUBE PLACEMENT CHART ON PAGE 5)



HORIZONTAL OSCILLATOR FIELD ADJUSTMENT

For adjustment of the Horiz. Oscillator, it is necessary to remove the rear cover and supply power to set. Adjustment is located on rear of chassis.Set the Horiz. Hold Control at the center of its range and adjust the coarse Horiz. Hold Control until picture synchronizes horizontally. (For location see tube placement chart.)

SOUND IF DETECTOR BUZZ ADJUSTMENT

To eliminate sound IF detector buzz, adjust the buzz control located on rear of the chassis for maximum volume and minimum buzz. If results are unsatisfactory, see align instructions on pages 6 and 7.

CENTERING

Centering is accomplished mechanically by adjusting two magnetic rings around the neck of the picture tube, located flush against the deflection yoke. Rotate the two rings around the neck of the tube until the picture is properly centered.

DISASSEMBLY INSTRUCTIONS

1. Remove 7 push-on type control knobs from top of cabinet.
2. Remove 5 metal screws from under side of cabinet.
3. Remove 4 metal screws. Remove rear cover.
4. Disconnect speaker leads
5. Remove 5 metal screws located on the sides and top of safety glass frame.
   Remove 2 metal screws located under top control knobs.
6. Slide picture tube and chassis from front of cabinet.

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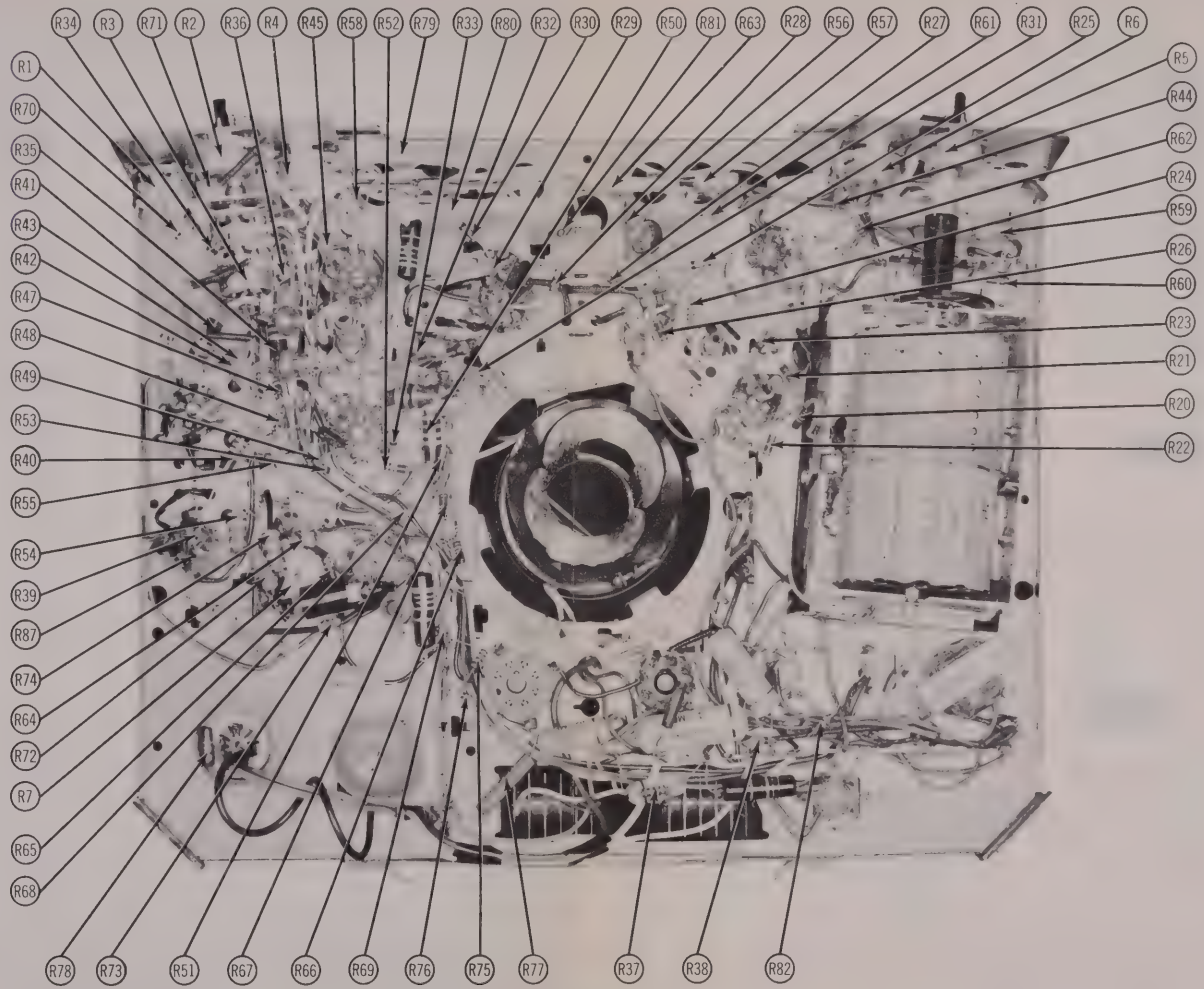
DENVER, COLORADO



CHASSIS BOTTOM VIEW-RESISTOR IDENTIFICATION

PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO

TRUETONE
MODEL D2483

TRUETONE
MODEL D2483

TRADE NAME	Truetone Model D2483
SUPPLIER	Western Auto Supply Co., 2107 Grand Ave., Kansas City, Mo.
TYPE SET	AC-DC Operated 2 Band AM Superheterodyne Receiver
TUBES (Six)	Types 12BA6 RF Amp., 12BE6 Conv., 12BA6 IF Amp., 12AT6 Det.-AVC-AF Amp., 35C5 Output, 35W4 Rectifier
POWER SUPPLY	110-120 Volts AC-DC — RATING .26 Amp. @ 117 Volts AC
TUNING RANGE—BROADCAST	540-1650KC — SHORT WAVE 5.8-18.3MC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Use isolation transformer, if available. If not, connect a .1MFD capacitor in series with low side of signal generator and B-. Loop should be maintained in same relative position to chassis as when receiver is in cabinet. Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.1MFD	High side to antenna stator lug on tuning gang. Low side to B-.	455KC (400%Mod)	BC	Tuning gang fully open	Across voice coil	A1, A2, A3, A4	Adjust for maximum output. If isolation transformer is not used, reduce dummy antenna to .001MFD to reduce hum modulation.
2.	"	"	"	"	"	"	A5	Adjust for MINIMUM output.
3.	400Ω carbon resistor	High side thru 400Ω to antenna lead. Low side to B-.	18.3MC	SW	"	"	A6	Adjust for maximum output. If two peaks are obtained use the one that occurs with least capacity.
4.	"	"	15MC	"	Tune to 15MC	"	A7	Adjust for maximum output while rocking tuning gang thru 15MC signal.
5.	100MMF	High side thru 100 MMF to antenna lead. Low side to B-.	1650KC	BC	Tuning gang fully open	"	A8	Adjust for maximum deflection.
6.	"	"	1500KC	"	Tune to 1500KC signal	"	A9	"
7.	"	"	600KC	"	Tune to 600KC signal	"	A10	Adjust for maximum output while rocking tuning gang thru 600KC signal.

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PARTS LIST AND DESCRIPTIONS

TRUETONE MODEL D2483

TUBES (SYLVANIA, GENERAL ELECTRIC, WESTINGHOUSE)

ITEM No.	USE	REPLACEMENT DATA: TRUETONE PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RETMA BASE TYPE	NOTES
V1	RF Amplifier	12BA6	12BA6	7BK	
V2	Converter	12BE6	12BE6	7CH	
V3	IF Amplifier	12BA6	12BA6	7BK	
V4	Det.-AVC-AF Amp	12AT6	12AT6	7BT	
V5	Output	35C5	35C5	7CV	
V6	Rectifier	35W4	35W4	5BQ	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: TRUETONE PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C1A	■60	200	150-108	AFH3-179		D067		FP433	TVL-3725	
B	▬10	450						TC47		
C	▲10	200								
D	50	50								
C2	.05	200	152-105	P288-05	DF-503	PJ2S5		PT415	2TM-S5	
C3	.01	400	152-103	P488-01	D6-103	CUB4S1	GP2-333-103	PT411	4TM-S1	
C4	300			SI300	D6-301	TP42	GP2K-301	UC-533	5GA-T3	
C5	100		156-102	SI100	D6-101	TP34	GP1K-101	UC-531	5GA-T1	
C6	11.5	500								Note 2
C7	33			SI33NP0	TCZ-33	TZ18	NP0K-330	ZT-5433	5TCC-Q33	Note 2
C8	4000	500	154-101	1468-004		1W5D39		MCB463	MS-24	
C9	.05	400	152-105	P488-05	DF-503	CUB4S5		PT415	4TM-S5	
C10	.05	400	152-105	P488-05	DF-503	CUB4S5		PT415	4TM-S5	
C11	300			SI300	D6-301	TP42	GP2K-301	UC-533	5GA-T3	Note 1
C12	.0022	600	152-101	P688-002	D6-202	CUB6D2	GP2-333-202	PT622	6TM-D2	Note 1
C13	300			SI300	D6-301	TP42	GP2K-301	UC-533	5GA-T3	Note 1
C14	.01	400	152-103	P488-01	D6-103	CUB4S1	GP2-333-103	PT411	4TM-S1	Note 1
C15	.01	400	152-103	P488-01	D6-103	CUB4S1	GP2-333-103	PT411	4TM-S1	Note 1
C16	.05	400	152-105	489ZX-05	DF-503	PJ4S5		PT415	4TM-S5	
C17	300			SI300	D6-301	TP42	GP2K-301	UC-533	5GA-T3	

Note 1. Some models may contain these parts in one unit.
Note 2. Not used in all models.

CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: TRUETONE PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	500KΩ	½	120-112	Q13-133	A47-500K-Z	B-60-S	U-48	Volume
B	Shaft		Not Req.	Not Req.	FS-3	Not Req.	Not Req.	Attach to R1A
C	Switch		Not Req.	76-1	SWE-12	Not Req.	US-26	Attach to R1A

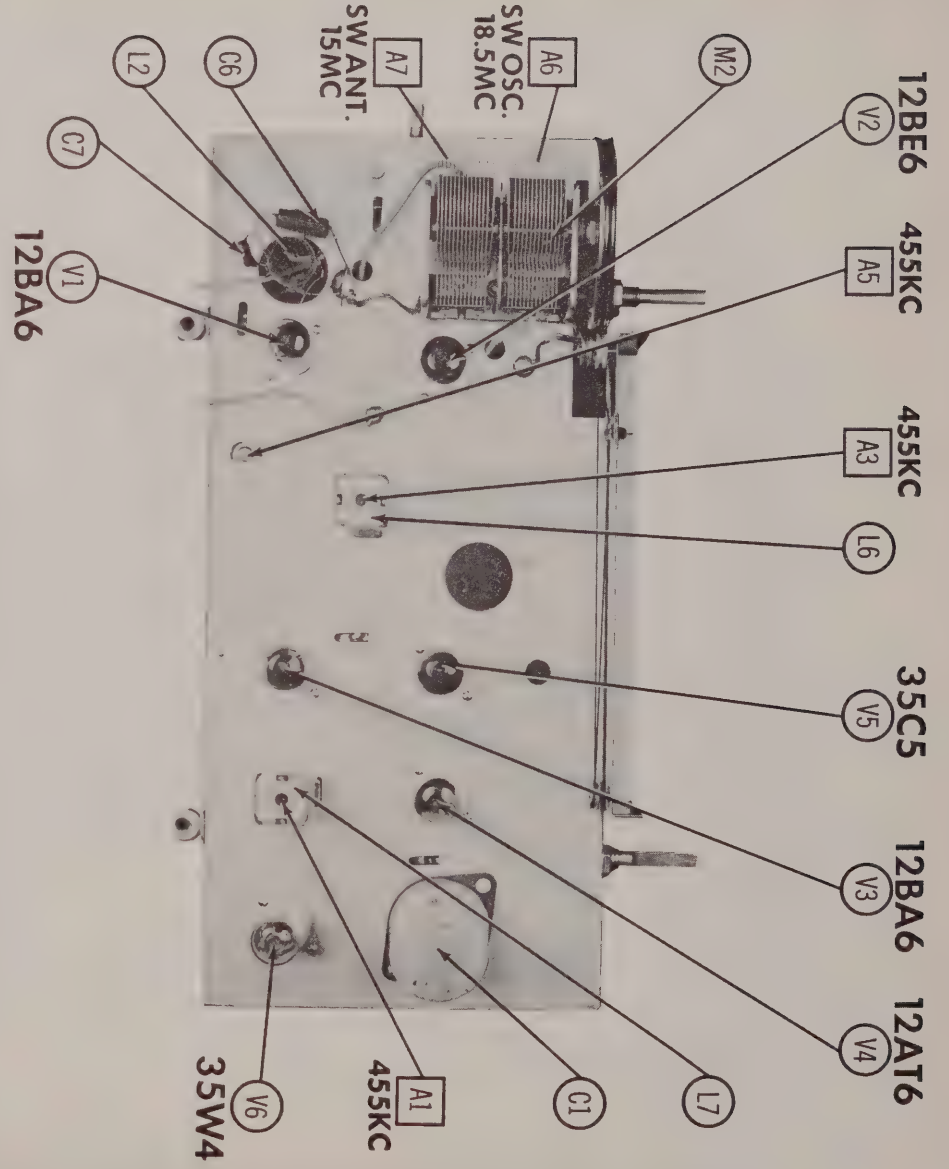
RESISTORS

ITEM No.	RATING: OHMS	RATING: WATT	REPLACEMENT DATA: TRUETONE PART No.	REPLACEMENT DATA: IRC PART No.	NOTES
R2	2.2Meg	½	180-107	BTS-2.2Meg	
R3	22Ω	¼	180-113	BTS-22	
R4	4700Ω	½	180-133	BTS-4700	
R5	68Ω	½		BTS-68	Note 3
R6	22KΩ	½	180-102	BTS-22K	
R7	100KΩ	½	180-116	BTS-100K	
R8	1000Ω	½	180-106	BTS-1000	
R9	150Ω	½	180-111	BTS-150	
R10	2.2Meg	½	180-107	BTS-2.2Meg	
R11	6.8Meg	½	180-135	BTS-6.8Meg	

ITEM No.	RATING: OHMS	RATING: WATT	REPLACEMENT DATA: TRUETONE PART No.	REPLACEMENT DATA: IRC PART No.	NOTES
R12	200KΩ	½		BTS-220K	
R13	470KΩ	½	180-110	BTS-470K	
R14	150Ω	½	180-111	BTS-150	
R15	2200Ω	1		BTA-2200	Note 1
R16	2200Ω	1		BTA-2200	Note 2
R17	68Ω	½	180-129		
R18	22Ω	½	180-113	BTS-22	
R19	100KΩ	½		BTS-100K	Note 1
R20	6000Ω	½			Note 1

Note 1. Not used in all models.
Note 2. Some models may use a 1500Ω resistor in this application.
Note 3. Some models may use a 150KΩ resistor in this application.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	TRUETONE PART No.	Stancor PART No.	Merit PART No.	Triad PART No.	Halldorson PART No.	Thordarson PART No.	
T1	2.3KΩ	3.3Ω	Part of Spkr.	A-3876	A-2928	S-1X	Z1001	24S50	

SPEAKER

ITEM No.	RATINGS			REPLACEMENT DATA			NOTES
	SIZE	FIELD	V. C. IMP.	TRUETONE PART No.	JENSEN PART No.	QUAM PART No.	
SP1	5"	PM	3.3Ω	175-108	ST-105 Mod. P5-X	5A1	

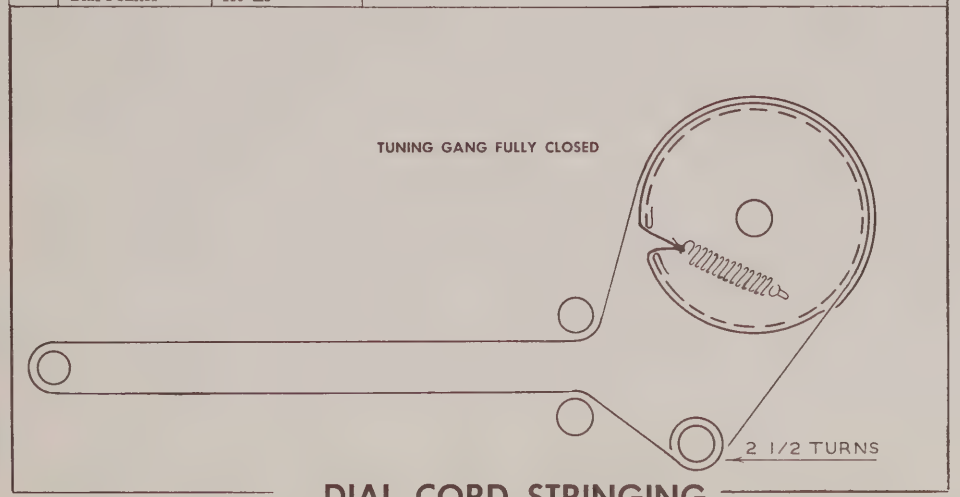
COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA				NOTES
		PRI.	SEC.	TRUETONE PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L1	Loop Ant.	0Ω	1Ω	134-101				
L2	Sw.Ant.Coil	.7Ω	0Ω	132-105	14-1064 ▲		C-5495A*	
L3	RF Choke	1.8Ω		132-106	19-1005 ■		4612 ■	Wound on 15KΩ resistor
L4	IF Trap	50Ω		130-105			816-X1	
L5A	BC Osc.Coil	.8Ω	4Ω					
B	Sw.Osc.Coil	0Ω		136-110	14-2862			0Ω tapped
L6	Input IF	17Ω	17Ω	130-102	16-6758	BC-352	12-C1	
L7	Output IF	17Ω	17Ω	130-102	16-6758	BC-353	12-C2	

* Drill mounting hole.
▲ Leads sufficient suppprt.
■ Parallel with 15KΩ resistor.

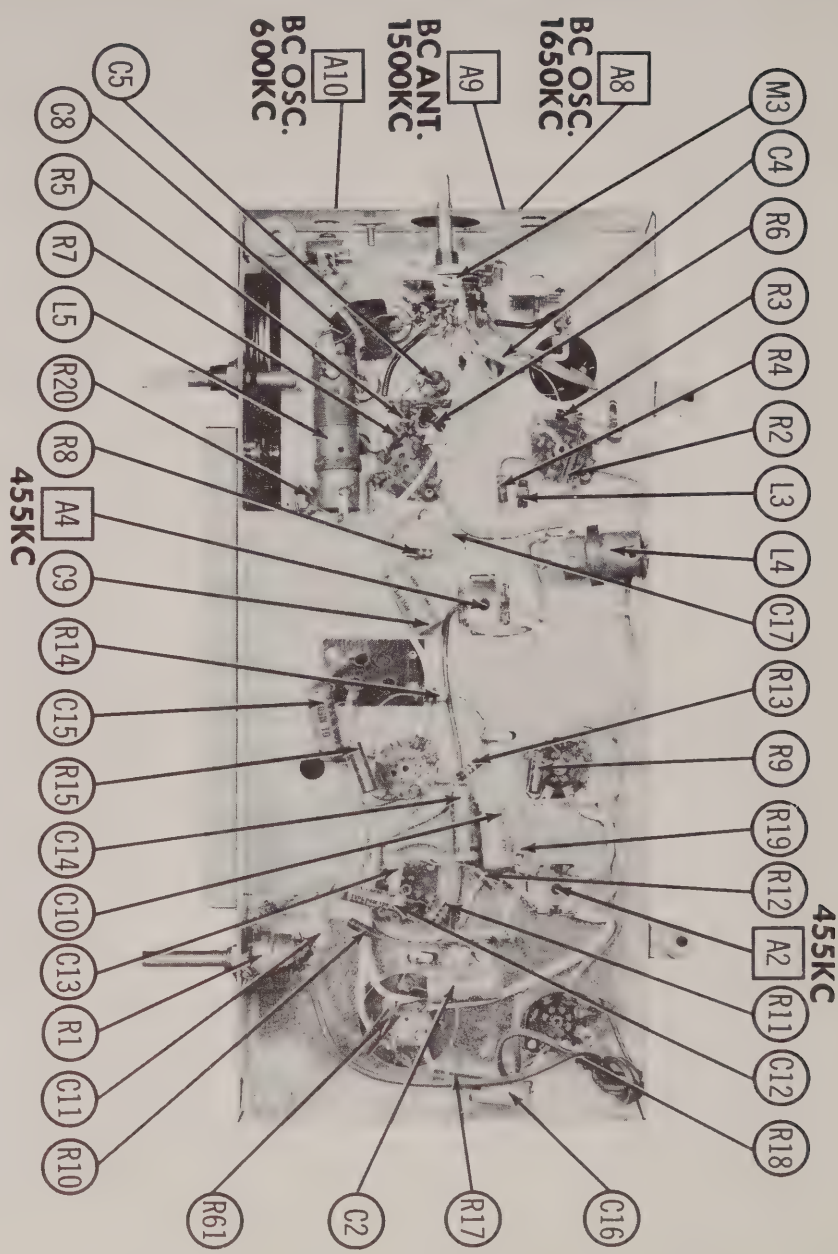
MISCELLANEOUS

ITEM No.	PART NAME	TRUETONE PART No.	NOTES
M1	Dial Light	140-116	Bayonet #47
M2	Tuning Cap.	160-101	30-443MMF, 30-443MMF
M3	Switch	125-105	Shortwave-Broadcast
A8,A9	Trimmer Cap.	162-102	2 Section (each 420MMF), Ant. & Osc.(broadcast)
A10	Trimmer Cap.	162-103	680MMF, Osc. (broadcast)
	Cabinet	210-106	Walnut, Bakelite
	Knob	220-112	Tuning & volume
	Knob	220-113	Band switch
	Dial Scale	215-116	
	Dial Pointer	140-115	

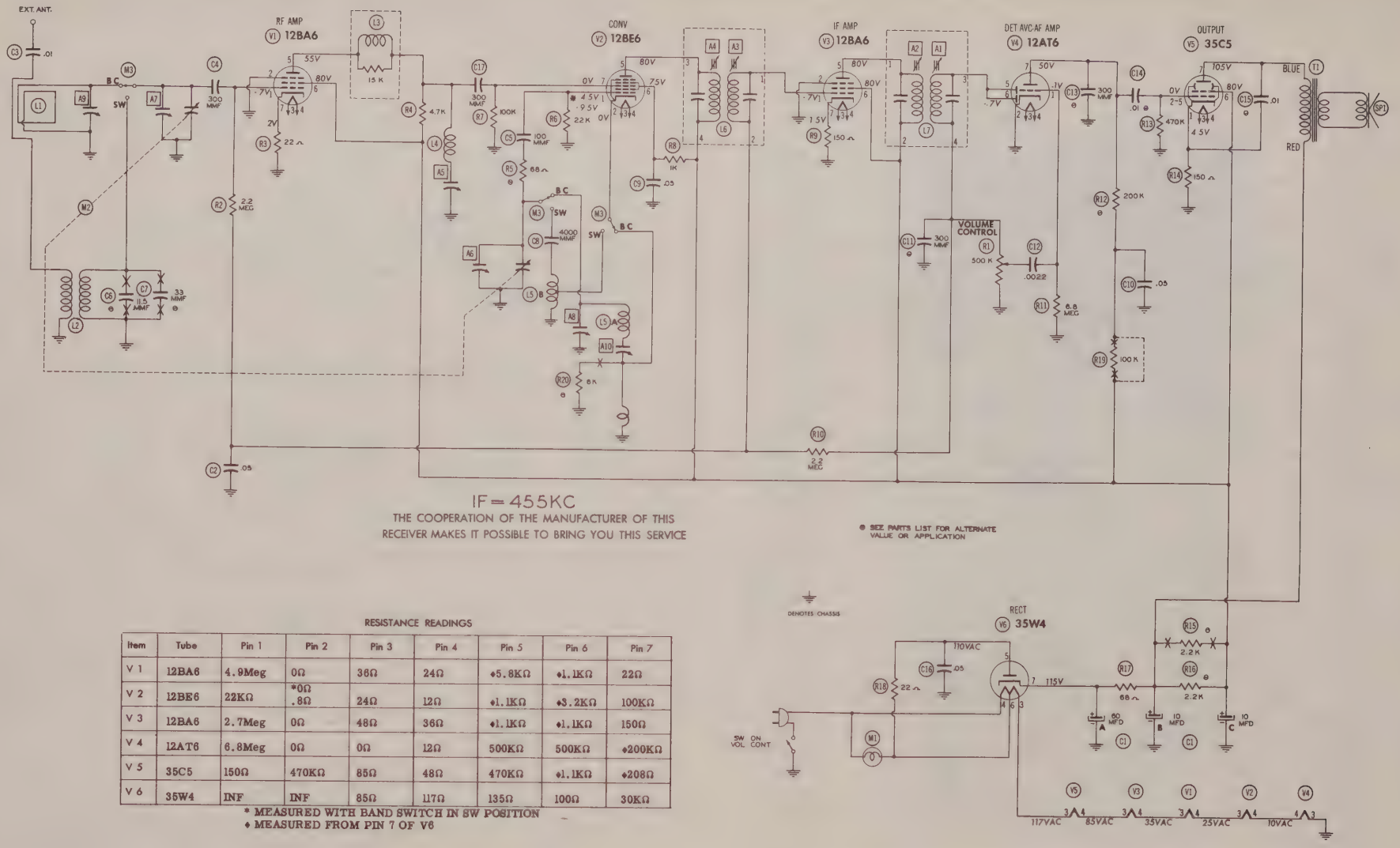


DIAL CORD STRINGING

CHASSIS—BOTTOM VIEW



TRUETONE MODEL D2483



IF = 455KC

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● SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V 1	12BA6	4.9Meg	0Ω	36Ω	24Ω	♦5.8KΩ	♦1.1KΩ	22Ω
V 2	12BE6	22KΩ	*0Ω .8Ω	24Ω	12Ω	♦1.1KΩ	♦3.2KΩ	100KΩ
V 3	12BA6	2.7Meg	0Ω	48Ω	36Ω	♦1.1KΩ	♦1.1KΩ	150Ω
V 4	12AT6	6.8Meg	0Ω	0Ω	12Ω	500KΩ	500KΩ	♦200KΩ
V 5	35C5	150Ω	470KΩ	85Ω	48Ω	470KΩ	♦1.1KΩ	♦208Ω
V 6	35W4	INF	INF	85Ω	117Ω	135Ω	100Ω	30KΩ

* MEASURED WITH BAND SWITCH IN SW POSITION
♦ MEASURED FROM PIN 7 OF V6

1. DC voltage measurements taken with vacuum tube voltmeter, AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 10% in voltage and resistance reading.
6. Volume control at maximum, no signal applied for voltage measurements

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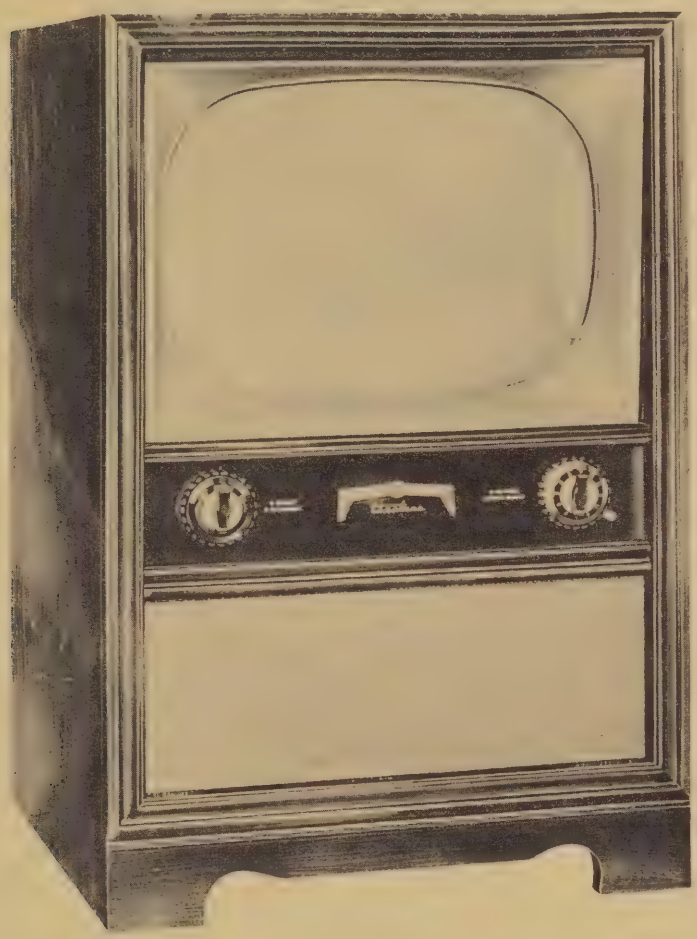

MODEL 2D1431A

TRUETONE
MODEL 2D1431A

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MODEL 2D1431A

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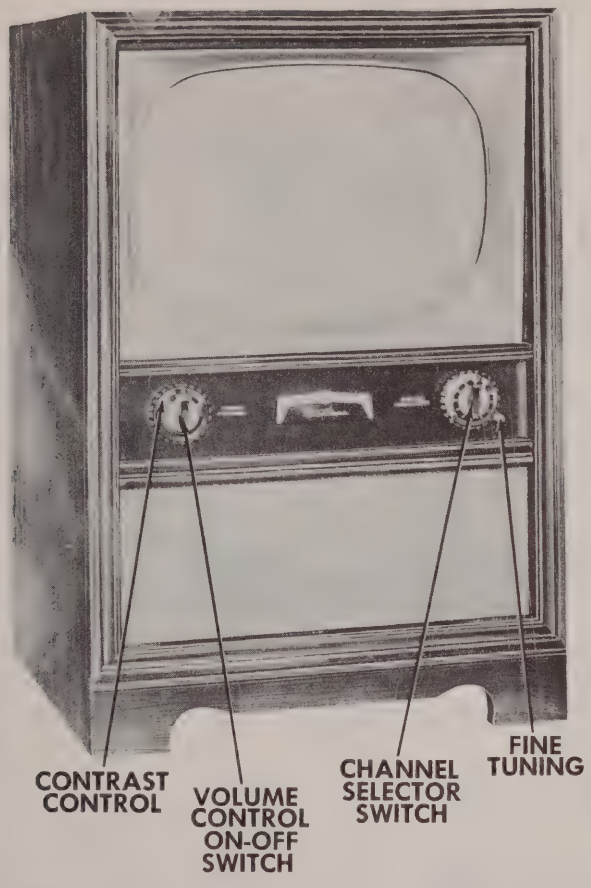

TRADE NAME	Truetone Model 2D1431A
SUPPLIER	Western Auto Supply Co., 2107 Grand Ave., Kansas City, Mo.
TYPE SET	Television Receiver
TUBES	Twenty-five
POWER SUPPLY	110-120 Volts AC-60 Cycle RATING 2.16 Amp. @ 117 Volts AC
TUNING RANGE	Channels 2 thru 13 VHF, 14 thru 83 UHF, Video IF 45.75MC, Sound IF 41.25MC (Intercarrier)

INDEX

Alignment Instructions 6, 7
Disassembly Instructions 22
Horizontal Sweep Circuit Adjustments 11
Parts List and Descriptions ..... 15 thru 19
Photographs
Cabinet-Rear View 11
Capacitor Identification (RF-IF Chassis) 4
Capacitor And Alignment Identification (Sweep Chassis) 9
Chassis-Top View (RF-IF Chassis) 3
Chassis-Top View (Sweep Chassis) 13
RF Tuner 10
Photographs (Cont)
Resistor, Inductor & Alignment Identification (RF-IF Chassis) 14
Resistor And Inductor Identification (Sweep Chassis) 20
Resistance Measurements 8
Servicing in the Field 22
Schematic 2
Trouble Shooting Aids 12, 21
Tube Failure Check Chart 5
Tube Placement Chart (Bottom View) 8
Tube Placement Chart (Top View) 5

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MODEL 2D1431A

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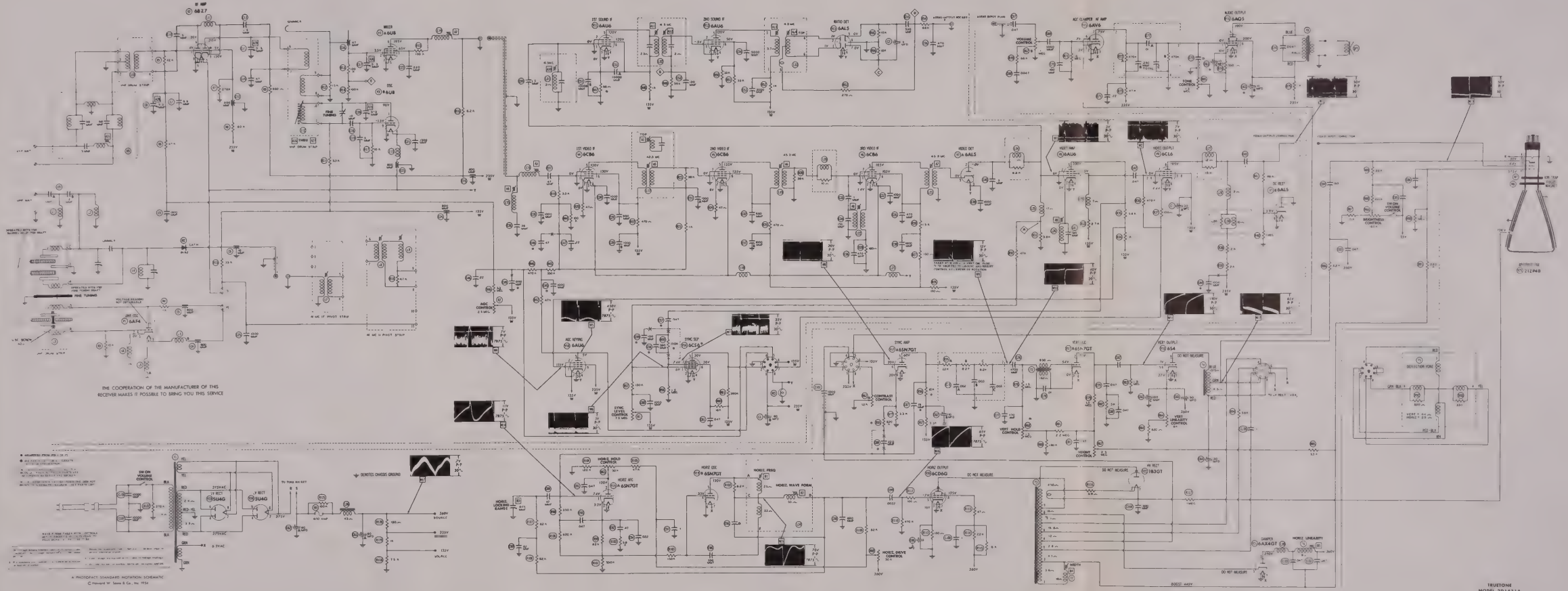
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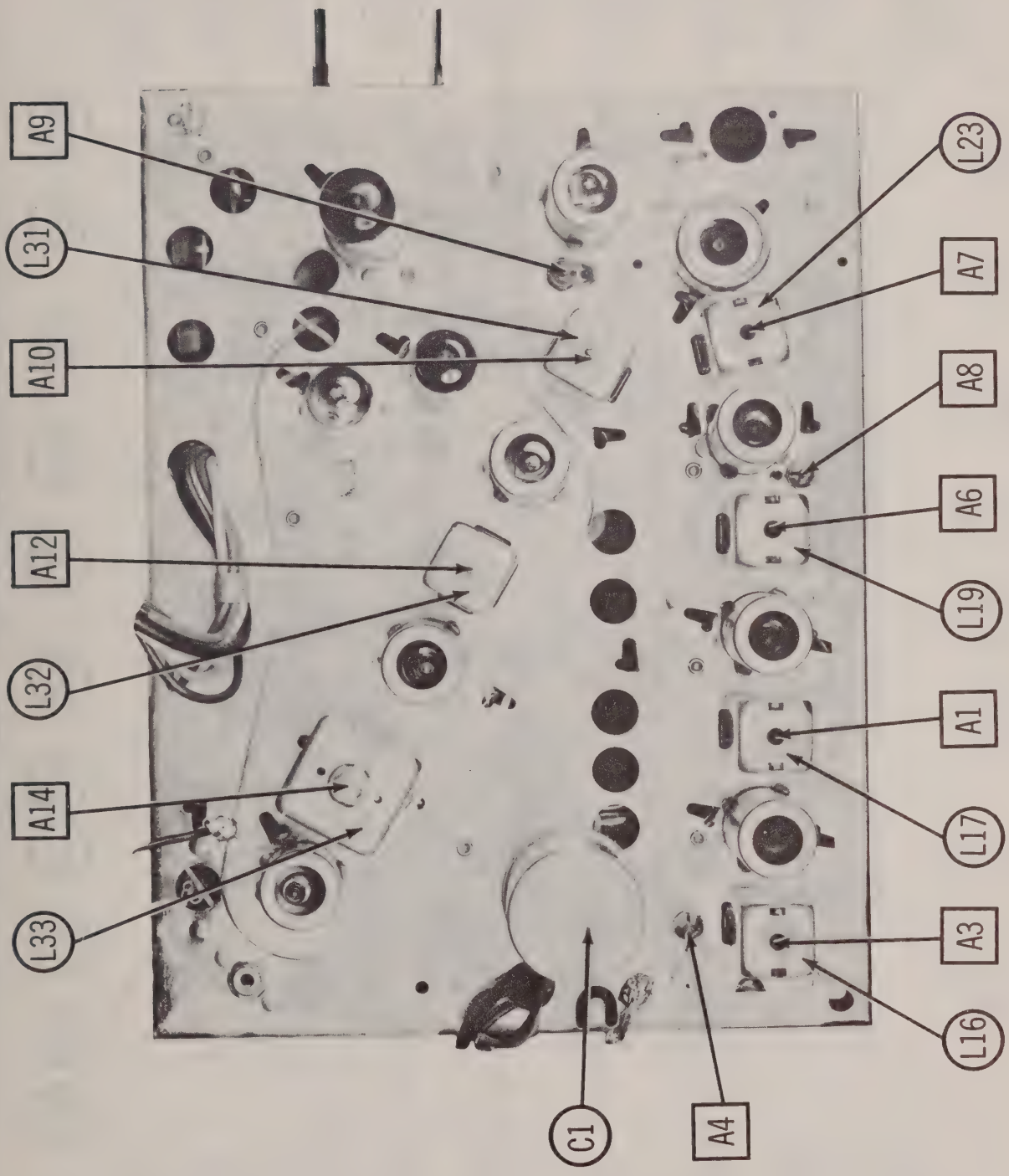
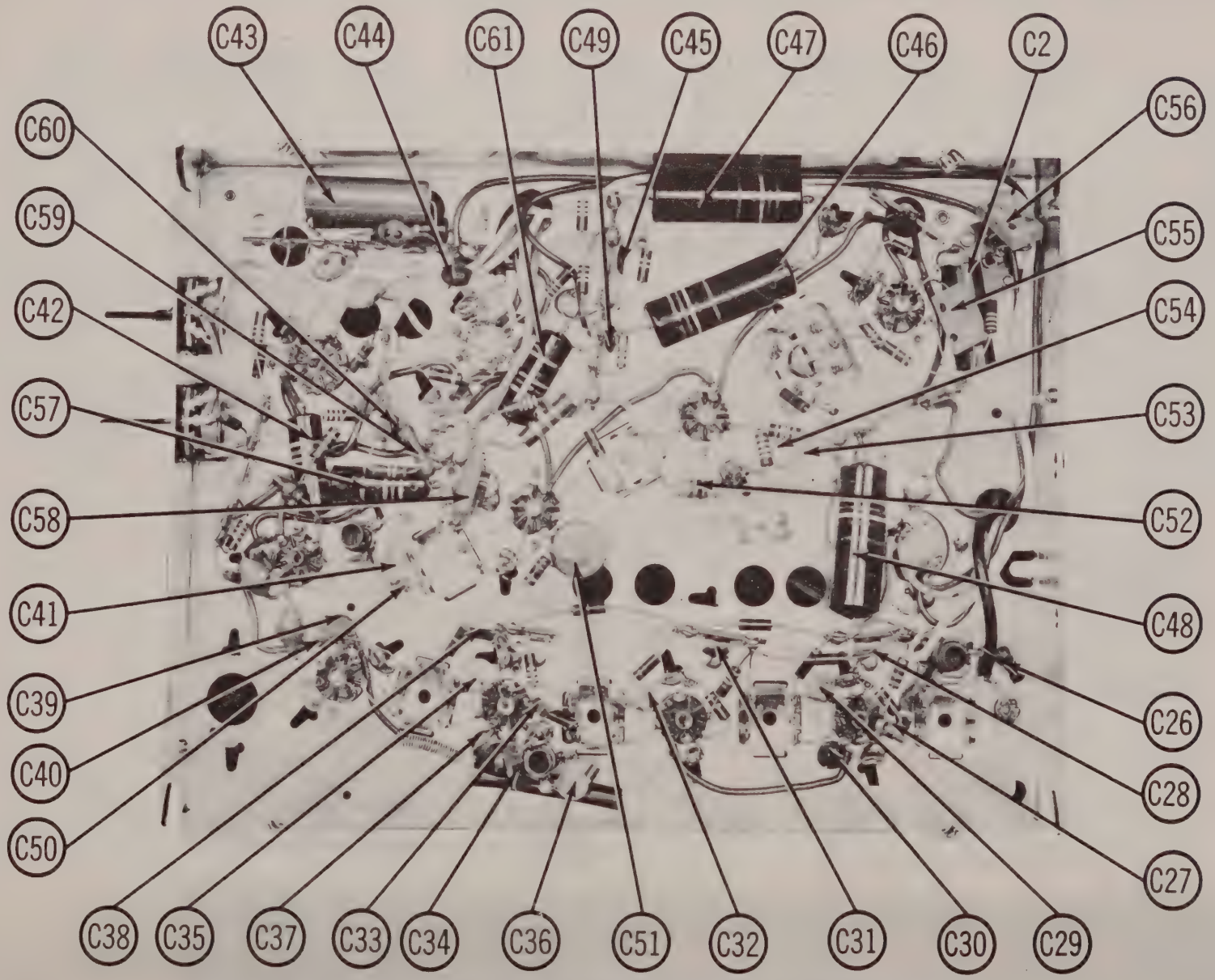


RF-IF CHASSIS-TOP VIEW

TRUETONE
MODEL 2D1431A



RF-IF CHASSIS-BOTTOM VIEW-CAPACITOR IDENTIFICATION

TUBE PLACEMENT CHART

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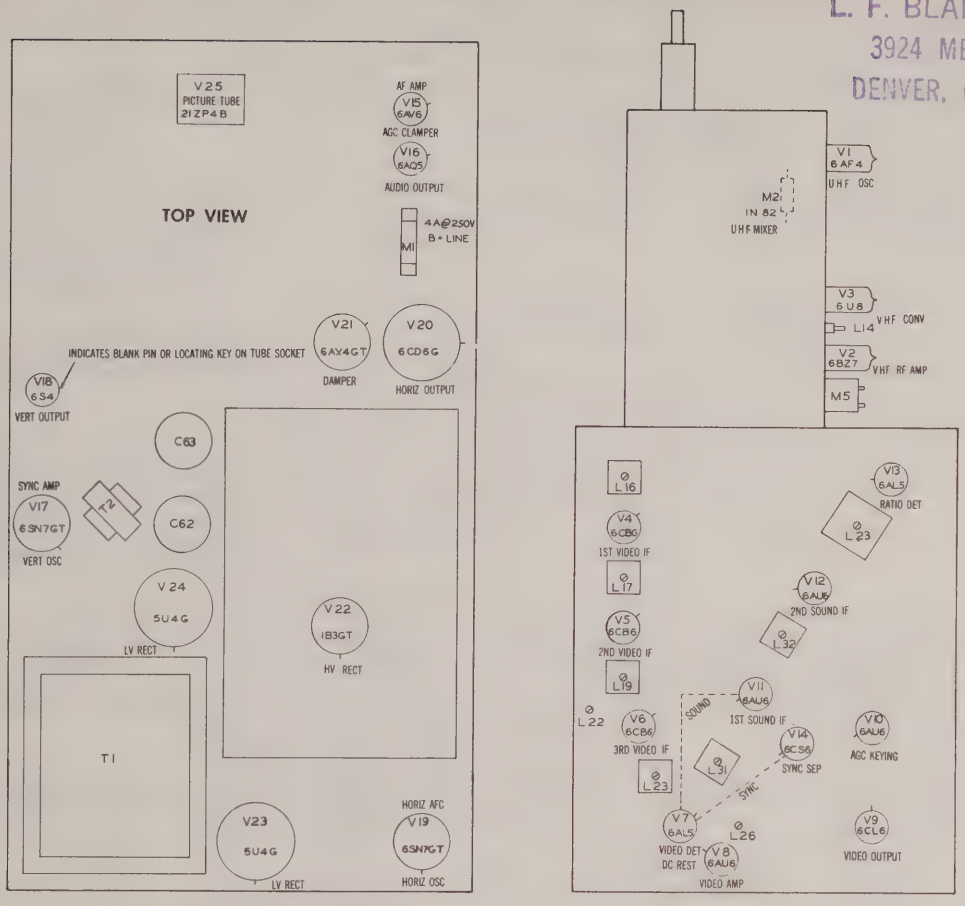


TUBE FAILURE CHECK CHART

The following chart lists tubes whose failures are most likely to produce the indicated symptoms. Refer to tube placement chart for location and type of tube.

POWER SUPPLY FAILURE
No raster, no sound - V23, V24, Fuse (M1)

LOSS OF PICTURE OR SOUND
No pic, no sound, has raster - V3, V4, V5, V6, V7, (V1 UHF only)
No pic, no sound, has snow - V2, V3, V4
No pic, has sound, has raster - V8, V9, V10, V25
Has pic, no sound - V11, V12, V13, V14, V15, V16
Overloaded picture - V10, V15

SYNC FAILURE
No vert. sync - V17
No horiz. sync - V17, V19
No vert. or horiz. sync - V14, V17

SWEEP FAILURE
No raster, has sound - V19, V20, V21, V22, V25
No vertical deflection - V17, V18
Poor vert. linearity or foldover - V17, V18
Poor horiz. linearity or foldover - V19, V20, V21
Narrow picture - V19, V20, V21, V22, V23, V24
Vert. off freq. - V17
Horiz. off freq. - V17, V19

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

The high voltage lead should be securely taped and kept away from the chassis. Do not remove the horizontal oscillator tube to disable the high voltage.

VIDEO IF ALIGNMENT

Connect the negative lead of a 1.5 volt battery to the ungrounded side of C28A. Connect the positive lead to chassis.
Remove the RF amplifier tube (V2) from its socket.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	Direct	High side to an ungrounded tube shield floating over converter tube (V3). Low side to tuner chassis.	44MC (10MC Swp)	41.25MC 45.75MC 47.25MC	Any unused channel	Vert. Amp. thru detector (Fig.1) to pin 5 (plate) of 6CB6 (V4). Low side to chassis.	A1, A2, A3, A4	Adjust A1 to place 47.25MC marker in trap notch as in Fig. 2. Adjust A2, A3 and A4 for response similar to Fig. 2. A2 and A3 affects flat portion of curve. A4 positions the 41.25MC marker. Make sure 45.75MC marker is on peak as shown or the 44.5MC marker on overall response curve (Fig.3) will be incorrect.
2.	"	"	Not used	42.5MC (Unmod)	"	Use VTVM DC probe to point Ⓐ. Common to chassis.	A5	Increase bias from 1.5 volts to 4.5 volts at ungrounded side of C28A. Attenuate generator output to maintain 1 volt at VTVM. Adjust for maximum deflection.
3.	"	"	"	45.3MC	"	"	A6	"
4.	"	"	"	43.9MC	"	"	A7	"
5.	"	"	"	41.25MC	"	"	A8	Adjust for MINIMUM deflection.
6.	"	"	44MC (10MC Swp)	41.25MC 42.25MC 42.5MC 43.9MC 44.5MC 45.3MC 45.75MC 47.25MC	"	Vert. Amp. thru 10KΩ to point Ⓐ. Low side to chassis.		Check for response curve similar to Fig.3. SLIGHTLY retouch A5 thru A8 to obtain desired response. If A1 thru A4 requires retouching step 1 should be repeated.

4.5MC TRAP ALIGNMENT

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
7.	10KΩ	High side thru 10KΩ to pin 2 (plate) of 6AL5 (V7A). Low side to chassis.	Not used	4.5MC (400∿Mod)	Any unused channel	Vert. Amp. to pin 2 (grid) of picture tube. Low side to chassis.	A9	Adjust for MINIMUM 400∿ indication on scope.

ALTERNATE 4.5MC TRAP ALIGNMENT

Replace the RF amplifier (V2) and remove bias battery. Tune in a TV station and adjust A9 for minimum 4.5MC beat interference in picture.

SOUND IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

Remove 6CB6 (V6) from its socket.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
8.	10KΩ	High side thru 10KΩ to pin 2 (plate) of 6AL5 (V7A). Low side to chassis.	4.5MC (Unmod)	Any	DC probe to point Ⓑ. Common to chassis.	A10, A11, A12	Adjust for maximum deflection.
9.	"	"	"	"	DC probe to point Ⓒ. Common to chassis.	A13	Use only enough generator output to provide usable indication at VTVM. Adjust for maximum deflection.
10.	"	"	"	"	DC probe to point Ⓓ. Common to chassis.	A14	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting. Replace V6 in its socket.

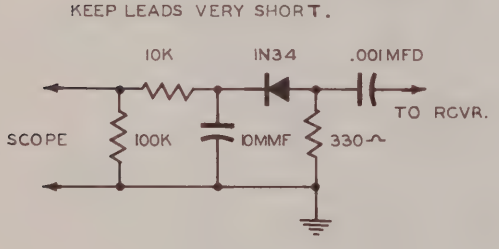


FIG. 1

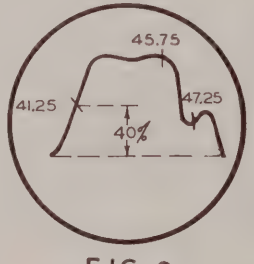


FIG. 2

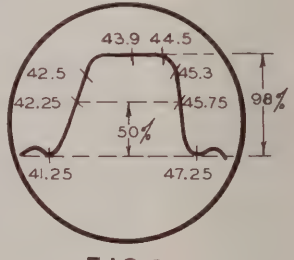


FIG. 3

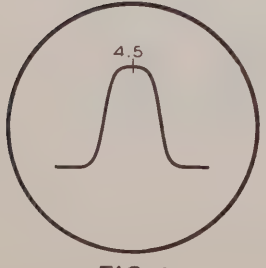


FIG. 4

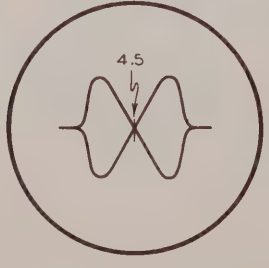


FIG. 5

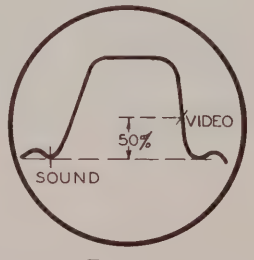


FIG. 6

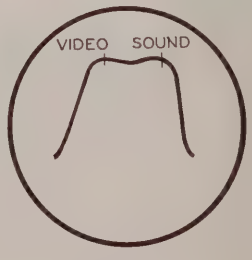


FIG. 7

ALIGNMENT INSTRUCTIONS (cont)

PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO

SOUND IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Remove 6CB6 (V6) from its socket.
Use frequency modulated signal with 60% modulation and 450KC sweep. Use 120% sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
8.	10KΩ	High side thru 10KΩ to pin 2 (plate) of 6AL5 (V7A). Low side to chassis.	4.5MC (450KC Swp)	4.5MC	Any	Vert. Amp. to point Ⓑ. Low side to chassis.	A10,A11, A12	Adjust for curve o maximum amplitude and symmetry similar to Fig. 4.
9.	"	"	"	"	"	Vert. Amp. to point Ⓒ. Low side to chassis.	A13	Disconnect stabilizing capacitor C2. Use only enough sweep generator output to provide usable indication on scope. Adjust for curve of maximum amplitude and symmetry similar to Fig. 4.
10.	"	"	"	"	"	Vert. Amp. to point Ⓓ. Low side to chassis.	A14	Reconnect stabilizing capacitor C2. Adjust so that 4.5MC occurs at center of crossover lines as in Fig. 5. SLIGHTLY retouch A14 for maximum amplitude and straightness of crossover lines. Replace V6 in its socket.

OSCILLATOR ALIGNMENT

Connect the negative lead of a 4.5 volt bias battery to the ungrounded side of C28A. Connect the positive lead to chassis.
Complete oscillator alignment may not be necessary. If the oscillator seems to be off frequency approximately the same amount for a majority of the channels it may be possible to correct them in one step using A15. It should be noted that this is an all channel oscillator circuit adjustment and should not be used to correct any individual channel. If adjustment of A15 will not bring all channels well within the range of the fine tuning control it will be necessary to adjust the channel strip adjustment screw for each channel that is off frequency. The channel oscillator adjustment screws are reached through a hole just to the left of the channel switch shaft (hole extends)through UHF tuner).
The correct adjustment screw is accessible through this hole as the channel switch is turned to each channel. Replace RF amplifier (V2) in its socket.
Remove bias battery.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Set the fine tuning control to the mid-position of its range.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
11.	Two 120Ω Carbon Resistors	Across VHF antenna terminals with 120Ω in each lead.	213MC (10MC Swp)	211.25MC 215.75MC	13	Vert. Amp. thru 10KΩ to point Ⓐ. Low side to chassis.	A16	Adjust to place sound marker in trap notch as in Fig. 6. Video marker should be at 50%.
			207MC (10MC Swp)	205.25MC 209.75MC	12		A17	
			201MC (10MC Swp)	199.25MC 203.75MC	11		A18	
			195MC (10MC Swp)	193.25MC 197.75MC	10		A19	
			189MC (10MC Swp)	187.25MC 191.75MC	9		A20	
			183MC (10MC Swp)	181.25MC 185.75MC	8		A21	
			177MC (10MC Swp)	175.25MC 179.75MC	7		A22	
			85MC (10MC Swp)	83.25MC 87.75MC	6		A23	
			79MC (10MC Swp)	77.25MC 81.75MC	5		A24	
			69MC (10MC Swp)	67.25MC 71.75MC	4		A25	
			63MC (10MC Swp)	61.25MC 65.75MC	3		A26	
			57MC (10MC Swp)	55.25MC 59.75MC	2		A27	

RF AND MIXER ALIGNMENT

Connect the negative lead of a 3 volt bias battery to the ungrounded side of C48. Connect the positive lead to chassis.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
12.	Two 120Ω Carbon Resistors	Across VHF antenna terminals with 120Ω in each lead.	207MC (10MC Swp)	205.25MC 209.75MC	12	Vert. Amp. thru 10KΩ to point Ⓔ. Low side to chassis.	A28,A29 A30	Adjust for response curve similar to Fig. 7 with markers above 90%.
13.	"	"	213MC (10MC Swp)	211.25MC 215.75MC	13	"		If markers fall below 70% on any channel make compromise adjustments of A28, A29 and A30 with channel switch set to that channel. Then check all other channels to see that they have not been seriously affected.
			201MC (10MC Swp)	199.25MC 203.75MC	11			
			195MC (10MC Swp)	193.25MC 197.75MC	10			
			189MC (10MC Swp)	187.25MC 191.75MC	9			
			183MC (10MC Swp)	181.25MC 185.75MC	8			
			177MC (10MC Swp)	175.25MC 179.75MC	7			
			85MC (10MC Swp)	83.25MC 87.75MC	6			
			79MC (10MC Swp)	77.25MC 81.75MC	5			
			69MC (10MC Swp)	67.25MC 71.75MC	4			
			63MC (10MC Swp)	61.25MC 65.75MC	3			
			57MC (10MC Swp)	55.25MC 59.75MC	2			

IF WAVE TRAP ADJUSTMENT

The IF wave trap should be tuned to minimize interference caused by signals which fall within the video IF band pass (40-48MC). Tune in a station on which the interference is noted and adjust A31 for minimum interference in the picture.

UHF OSCILLATOR ADJUSTMENT

The UHF oscillator channel strip adjustments are reached through the same hole provided for VHF channel oscillator adjustment screws. Tune in all UHF stations available and check each one to see if the fine tuning control can be tuned through a point where clearest picture and best sound occur. If the fine tuning control does not have sufficient range on any UHF channel strip set the fine tuning control to its mid range position and then adjust the UHF channel strip oscillator screw for clearest picture and best sound.

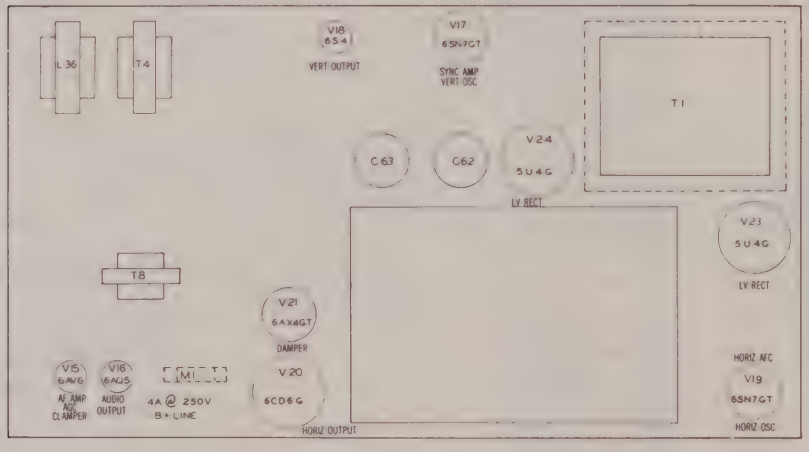
UHF RF ALIGNMENT

The UHF RF portion of this receiver has been properly aligned at the factory and is very stable.
If the RF section should ever require alignment or major repair of the UHF tuner become necessary, the entire UHF tuner should be returned to the factory service department.

RESISTANCE MEASUREMENTS

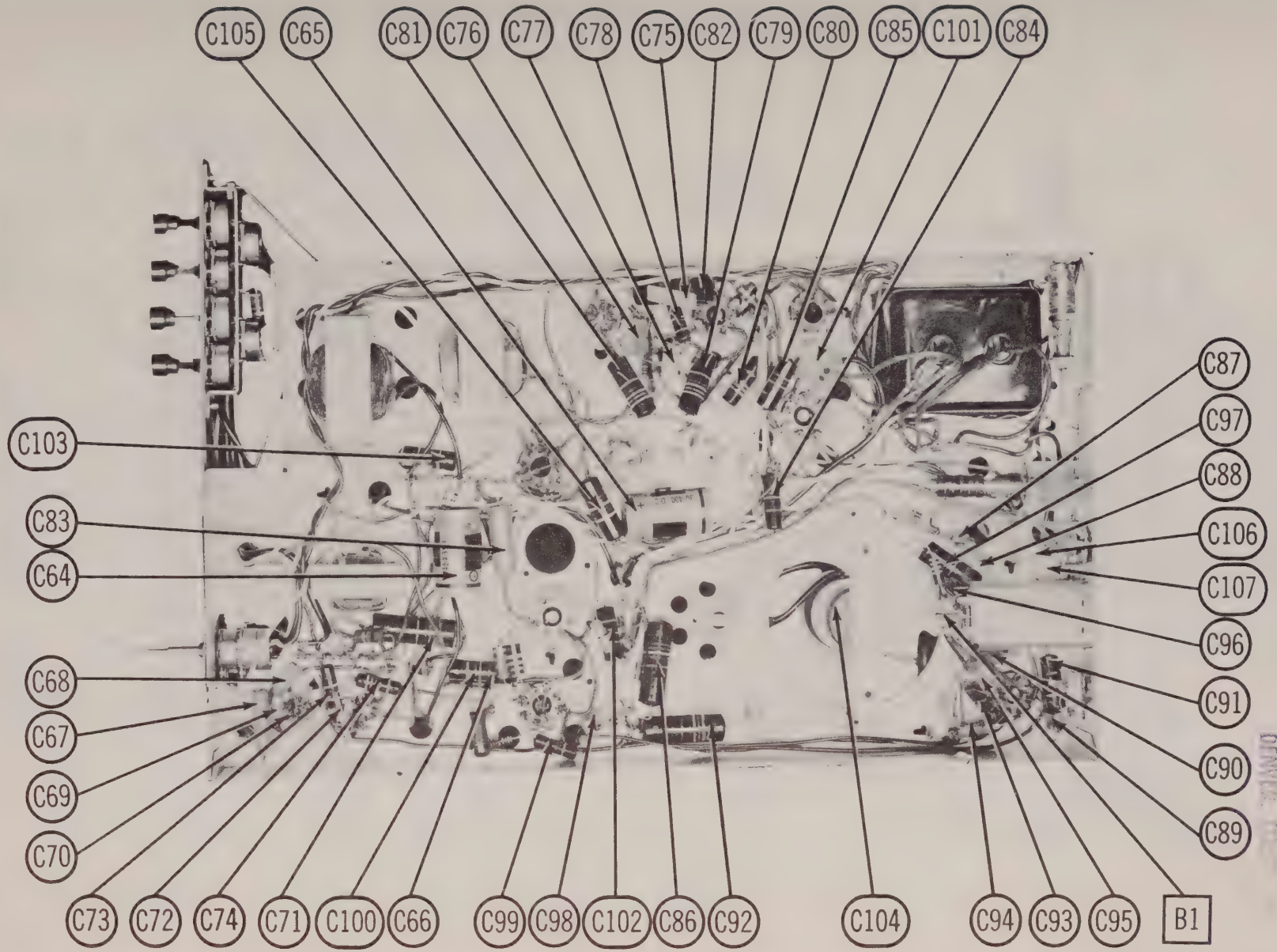
Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6AF4	†▲5. 3KΩ	10KΩ	. 1Ω	0Ω	0Ω	10KΩ	†▲5. 3KΩ		
V 2	6BZ7	† 900Ω	120KΩ	INF.	0Ω	. 1Ω	INF.	950KΩ	0Ω	0Ω
V 3	6U8	† 5. 5KΩ	200KΩ	†100KΩ	. 1Ω	0Ω	† 8. 4KΩ	0Ω	0Ω	10KΩ
V 4	6CB6	100KΩ	47Ω	0Ω	. 1Ω	† 1. 7KΩ	† 1. 7KΩ	0Ω		
V 5	6CB6	100KΩ	47Ω	0Ω	. 1Ω	† 1. 8KΩ	† 1. 8KΩ	0Ω		
V 6	6CB6	. 1Ω	180Ω	0Ω	. 1Ω	† 3KΩ	† 3KΩ	0Ω		
V 7	6AL5	1 Meg	3. 9KΩ	. 1Ω	0Ω	. 5Ω	0Ω	0Ω		
V 8	6AU6	3. 9KΩ	0Ω	0Ω	. 1Ω	† 8. 8KΩ	† 3. 9KΩ	. 2Ω		
V 9	6CL6	500Ω	470KΩ	† 1. 2KΩ	. 1Ω	0Ω	† 4KΩ	0Ω	† 1. 2KΩ	470KΩ
V 10	6AU6	† 2. 2KΩ	† 1. 2KΩ	0Ω	. 1Ω	475KΩ	† 210Ω	† 1. 2KΩ		
V 11	6AU6	2Ω	0Ω	0Ω	. 1Ω	† 2. 2KΩ	† 2. 2KΩ	68Ω		
V 12	6AU6	56KΩ	0Ω	0Ω	. 1Ω	† 2. 2KΩ	† 34. 2KΩ	0Ω		
V 13	6AL5	INF.	INF.	0Ω	. 1Ω	10KΩ	0Ω	10KΩ		
V 14	6CS6	40KΩ	0Ω	0Ω	. 1Ω	† 390KΩ	† 19KΩ	1. 5Meg		
V 15	6AV6	10 Meg	0Ω	. 1Ω	0Ω	900KΩ	900KΩ	† 515KΩ		
V 16	6AQ5	470KΩ	330Ω	. 1Ω	0Ω	† 1. 6KΩ	† 1. 2KΩ	470KΩ		
V 17	6SN7GT	2. 5Meg	▲ 1. 8Meg	162Ω	† 390KΩ	† 14. 5KΩ	3. 3KΩ	. 1Ω	0Ω	
V 18	6S4	INF.	3. 5KΩ	1. 8Meg	0Ω	. 1Ω	1. 8Meg	INF.	INF.	▲ 5. 5KΩ
V 19	6SN7GT	1. 5Meg	† 80KΩ	410KΩ	480KΩ	† 120KΩ	0Ω	. 1Ω	0Ω	
V 20	6CD6G	470KΩ	0Ω	150Ω	† 10KΩ	470KΩ	INF.	. 1Ω	† 10KΩ	TOP CAP ▲ 19Ω
V 21	6AX4GT	† 50Ω	INF.	600KΩ	INF.	† 55Ω	INF.	. 1Ω	0Ω	
V 22	1B3GT				PINS 1-8 HAVE INF. RESISTANCE					TOP CAP ▲ 469Ω
V 23	5U4G	INF.	7KΩ	INF.	12Ω	INF.	14Ω	0Ω	7KΩ	
V 24	5U4G	INF.	7KΩ	INF.	12Ω	INF.	14Ω	INF.	7KΩ	
V 25	21ZP4B	. 1Ω	1. 2Meg	PIN 10 ▲200KΩ	PIN 11 † 160KΩ	PIN 12 0Ω				

† MEASURED FROM PIN 2 OF V24.
▲ MEASURED IN UHF POSITION.
▲ MEASURED FROM PIN 3 OF V21.



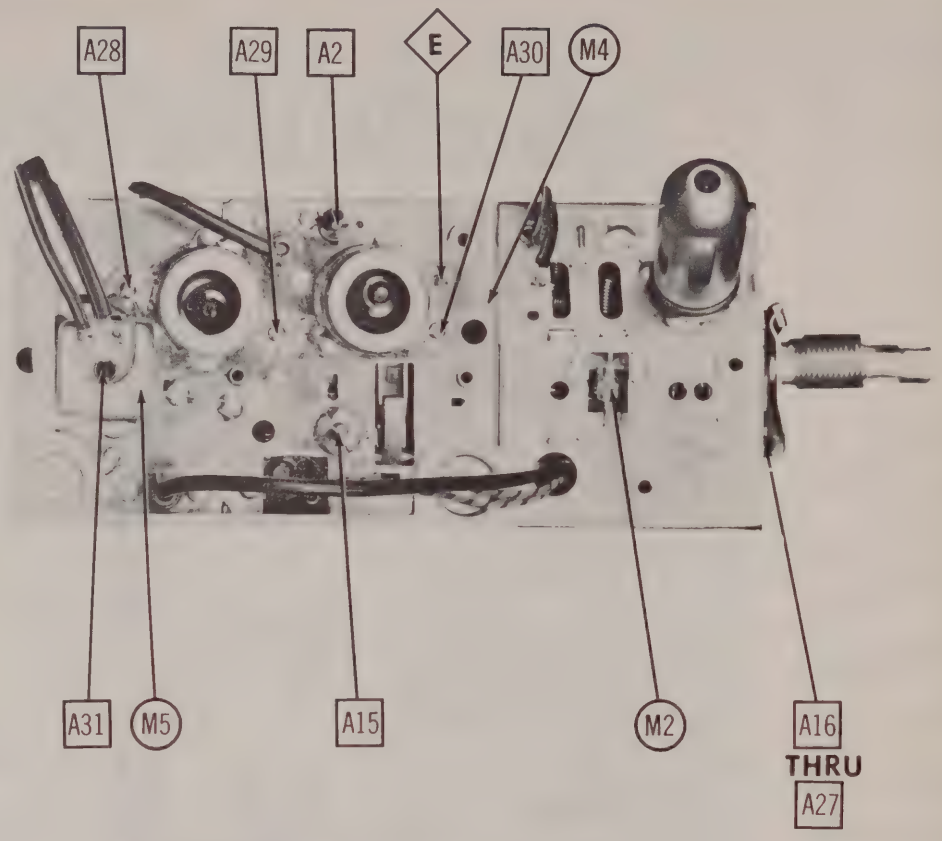
BOTTOM VIEW

TUBE PLACEMENT CHART

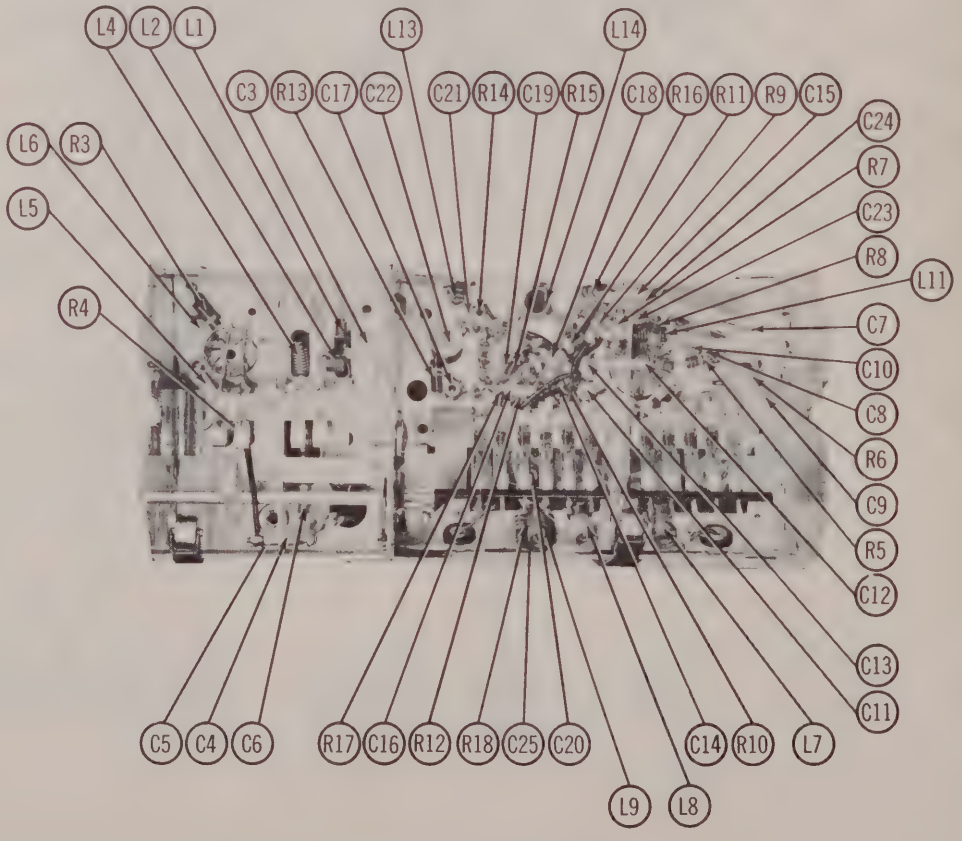


SWEEP CHASSIS BOTTOM VIEW-CAPACITOR AND ALIGNMENT IDENTIFICATION

PROPERTY OF
L. F. BLANKENSHIP
3324 MEADE ST
DENVER, CO

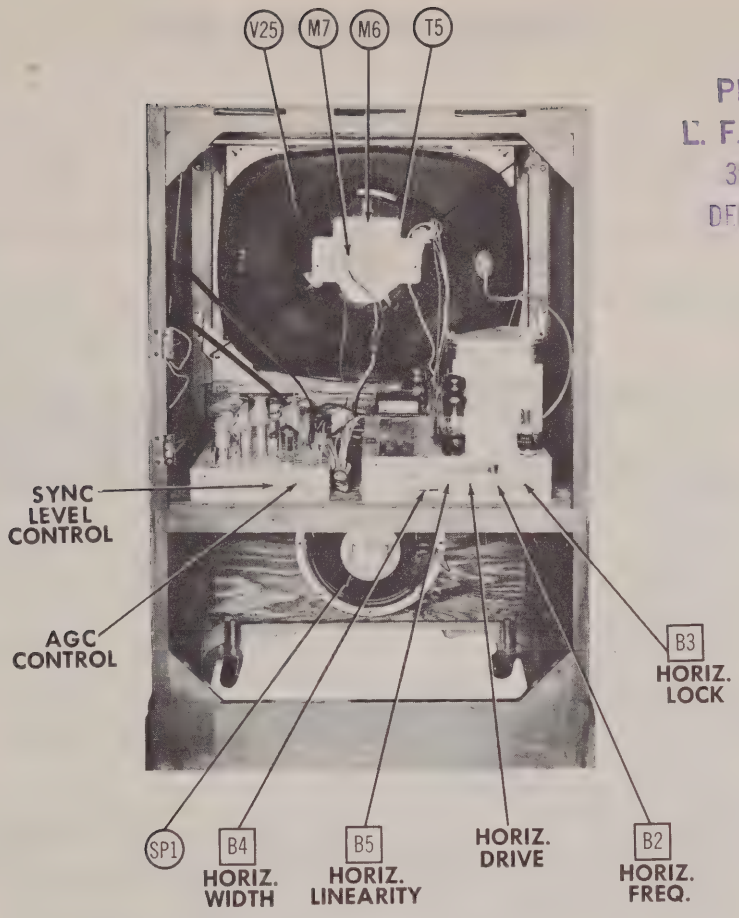


RF TUNER-TOP VIEW



RF TUNER-BOTTOM VIEW

PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO



CABINET—REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Turn the set on and tune in a TV station, preferably a test pattern.

HORIZONTAL FREQUENCY ADJUSTMENT
Turn the horizontal hold control fully clockwise.
Adjust the horizontal frequency slug (B1) until the picture is just ready to lose sync. If necessary, slightly readjust the horizontal locking range trimmer (B3) to obtain this condition.

HORIZONTAL WAVEFORM ADJUSTMENT
Connect the vertical amplifier of an oscilloscope through a 10MMF capacitor to terminal "C" of L34.
Adjust the horizontal waveform slug (B2) for a waveform similar to Fig. 8. If necessary, keep picture in sync by turning horizontal hold control counter clockwise.

HORIZONTAL LOCKING RANGE ADJUSTMENT
Turn the horizontal hold control fully counter clockwise then switch off channel and back again. Slowly turn the horizontal hold control in a clockwise direction until picture just pulls into sync. If more than 3 diagonal bars were present just before picture pulled into sync adjust B3 slightly clockwise. If less than 2 bars were present adjust B3 slightly counter clockwise. Turn the horizontal hold control counter clockwise and switch off channel and back again and recheck number of bars before picture pulls into sync. Repeat procedure until 2 to 3 bars are present just before picture pulls into sync.
The horizontal holding action should now be as follows:

(a) Turn horizontal hold control fully counter clockwise. The picture should remain in sync.
(b) Switch off channel and back again. Picture may be out of sync.
(c) Turn horizontal hold control slowly clockwise and note number of bars just before picture pulls into sync. Two to three bars should be present.
(d) Turn horizontal hold control fully clockwise. Picture should be just ready to pull out of sync.

If necessary repeat "Horizontal frequency Adjustment" and "Horizontal Locking range Adjustment" until proper horizontal holding action as outlined above is obtained.
Adjust the horizontal drive control clockwise as far as possible without the presence of vertical white lines or compression near the center of the picture.
Adjust the horizontal width slug (B4) for a picture slightly wider than necessary to fill the picture mask horizontally.
Adjust the horizontal linearity slug (B5) for a picture that is symmetrical from left to right.

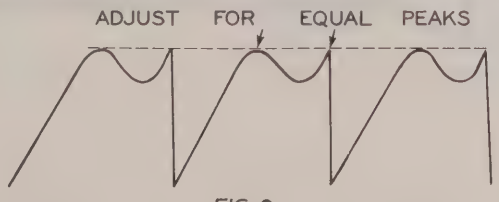


FIG. 8

TROUBLE SHOOTING AIDS

SWEEP

HORIZONTAL

LOSS OF SWEEP

Follow procedure outlined under "Loss of High Voltage".

INSUFFICIENT SWEEP

Check by substitution V20, and V21. Check R115, R114, R112, T3, T5A, and C66. Check adjustments R69 and B4.

DRIVE LINES

Check by substitution V20 and V21. Check C99, R114, R115, T3 and T5A and other associated components.

COMPRESSED LEFT SIDE

Check by substitution V20 and V21 and check horizontal output and damper stages for component failure or change of value. Check T3 and T5A.

FOLDS

Follow procedure outlined under "Drive Lines".

PIE CRUST EFFECT

Check by substitution V19, V20 and V21. Check C93 for open. Check L34, R102, R105, C97 and other associated components.

XMAS TREE EFFECT

Check by substitution V19, V20 and V21. Check L34, R102, R100, C96, C98 and C99 and other associated components.

VERTICAL

LOSS OF SWEEP

Check by substitution V17 and V18. Check wave form W11.

If Satisfactory	If Unsatisfactory
Check T4, T5B, C64, C65, R84, R64 and other associated components.	Check T2, R79, R82, R67, C82, C81 and other associated components.

INSUFFICIENT SWEEP

Check by substitution V17, V18. Check height and vertical linearity controls for proper adjustment. Check T4 and T5B.

COMPRESSED AT BOTTOM

Check by substitution V17, and V18. Check R67, R79, C81, T2 and other associated components.

COMPRESSED AT TOP

Check by substitution V17 and V18. Check R84, R64, C62, C65 and other associated components.

FOLDS

Check by substitution V17 and V18. Check C79, R82, C80, C82 and other associated components.

SYNC

LOSS OF VERTICAL AND HORIZONTAL SYNC

Check by substitution V14 and V17. Check C57, C61, R60 R61, R96, R97 and other associated components.

LOSS OF VERTICAL SYNC- HORIZONTAL SYNC SATISFACTORY

Substitute V17. Check wave form W9.

If Satisfactory	If Unsatisfactory
Check T2, C78, C76, C77, R68, R78 and other associated components.	Check vertical integrator network. Check video IF alignment for overloading.

LOSS OF HORIZONTAL SYNC-VERTICAL SYNC SATISFACTORY

Check by substitution V19. Check C88 if used in set. Check C89, R105, R63, R104, R101 and other associated components.

HORIZONTAL BENDING

Check by substitution V14, V17 and V19. Check horizontal AFC network.

VIDEO

LOSS OF VIDEO

Check by substitution V8 and V9. Check C42, C43, C1A, R34, R35, L27, L28, L30 and other associated components.

SOUND BARS (4.5MC BEAT)

Adjust tuner fine tuning for best sound and picture. Check video IF alignment. Check adjustment A9.

POOR CONTRAST

Check by substitution T8 and T9. Check contrast control, picture tube, R37, L27, L24 and other associated components.

NEGATIVE PICTURE

Check by substitution V8 and V9. Check picture tube. Check video detector network. Check L27, C43 and other associated components.

SMEAR

Check by sbustitution V8 and V9. Check L24, L25, L27, C43 . Check AGC network and other associated compontents.

WIDE BLACK BAR ACROSS PICTURE

Check by substitution V2, V4, V5, V6, V7, V8 and V9 for heater to cathode leakage.

AUDIO

WEAK OR NO SOUND

Check by substitution V11, V12, V13, V15 and V16. Check stages V15 and V16 using audio signal generator. Apply audio signal across R62B.

If Satisfactory	If Unsatisfactory
Check ratio detector and audio IF for component failure or change of value.	Check C67, C69 C72, C74, R75, R72, T8, speaker and other associated components.

BUZZ

Adjust tuner fine tuning for best sound and picture. Check adjustment A14 for minimum buzz. If still unsatisfactory check audio IF alignment.

DISTORTED

Follow procedure outlined under "Weak or No Sound".

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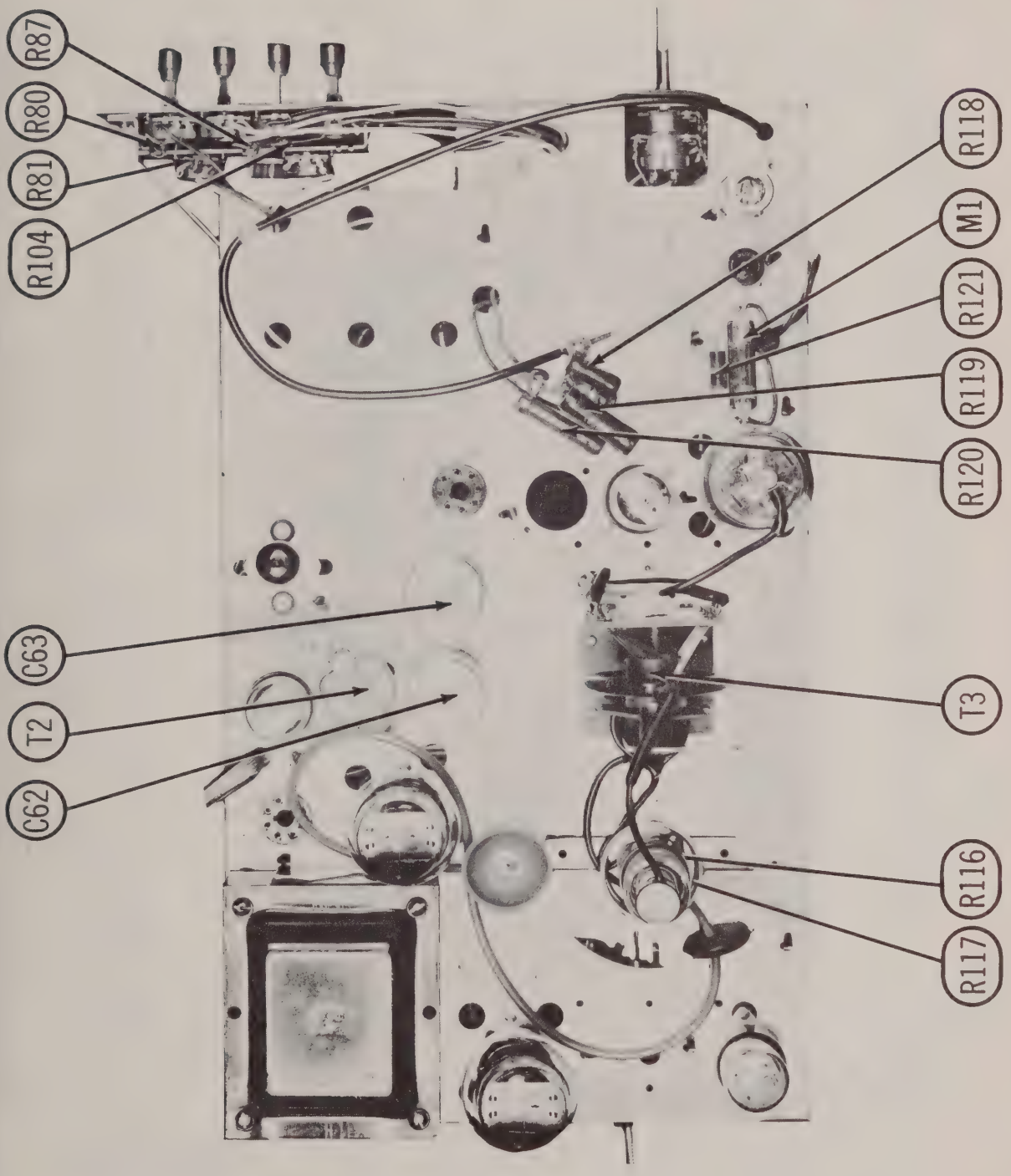
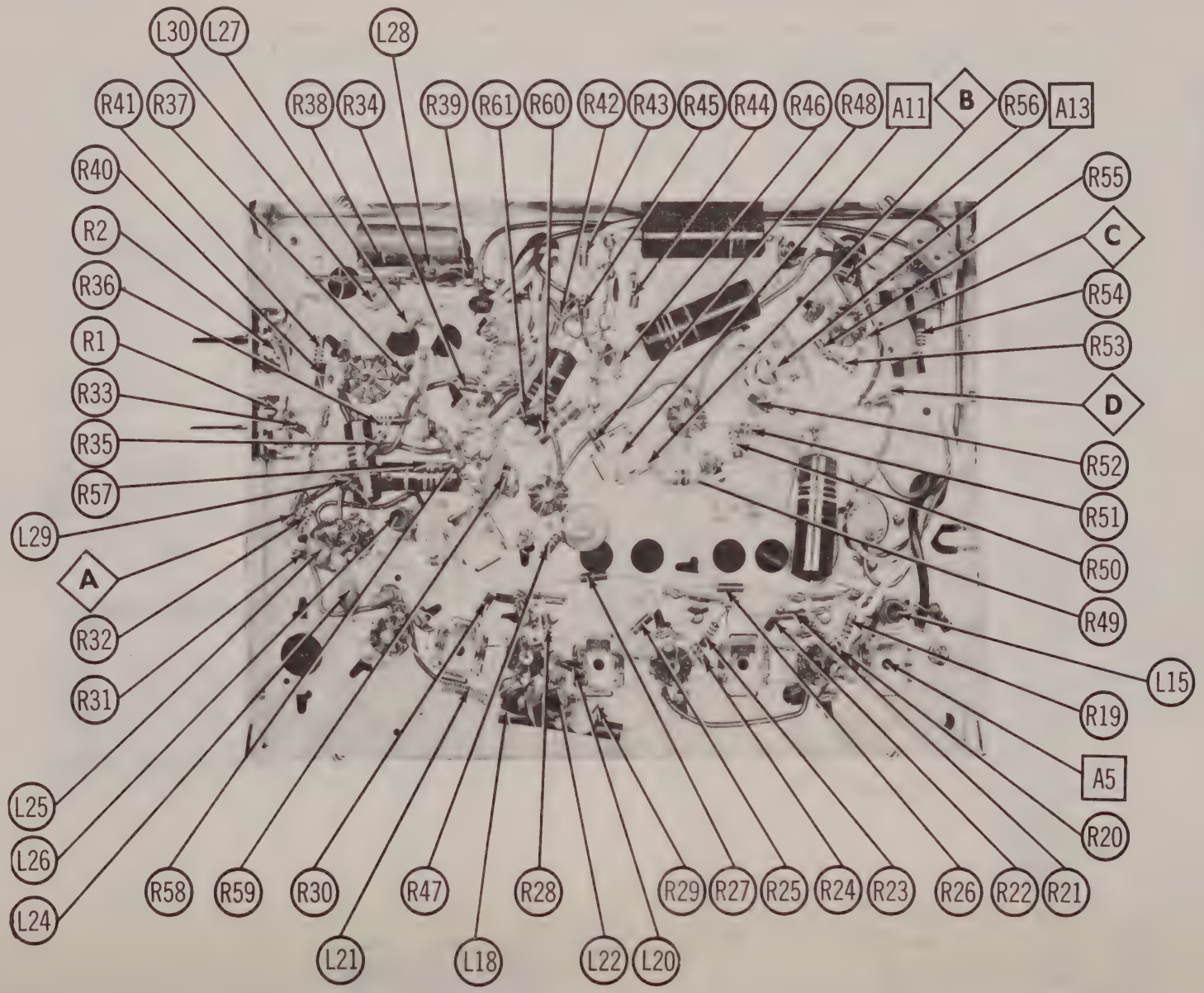
DENVER, COLORADO



SWEEP CHASSIS-TOP VIEW

TRUETONE
MODEL 2D1431A



RF-IF CHASSIS-BOTTOM VIEW-RESISTOR INDUCTOR AND ALIGNMENT IDENTIFICATION

PARTS LIST AND DESCRIPTIONS

RF-IF CHASSIS

PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO

TUBES (SYLVANIA, GENERAL ELECTRIC, WESTINGHOUSE)

ITEM No.	USE	REPLACEMENT DATA		RETMA BASE TYPE	NOTES
		TRUETONE PART No.	STANDARD REPLACEMENT		
V1	UHF Oscillator	6AF4	6AF4	7DK	
V2	VHF RF Amp.	6BZ7	6BZ7	9AJ	
V3	VHF Converter	6U8	6U8	9AE	
V4	1st. Video IF Amp.	6CB6	6CB6	7CM	
V5	2nd. Video IF Amp.	6CB6	6CB6	7CM	
V6	3rd. Video IF Amp.	6CB6	6CB6	7CM	
V7	Video Detector-DC Restorer	6AL5	6AL5	6BT	
V8	Video Amp.	6AU6	6AU6	7BK	
V9	Video Output	6CL6	6CL6	6CL6	
V10	AGC Keying	6AU6	6AU6	7BK	
V11	1st. Sound IF Amp.	6AU6	6AU6	7BK	
V12	2nd. Sound IF Amp.	6AU6	6AU6	7BK	
V13	Ratio Detector	6AL5	6AL5	6BT	
V14	Sync Separator	6CS6	6CS6	7CH	When the rear of the chassis is not marked with red paint, a 6BE6 is then used in this application.

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	TRUETONE PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C1A	▲30	350	45X408	AFH3-39		C030		FP428	TVL-3782	
B	▲60	350								
C2	5	25	47X378	PRS150/4		BR550		TC30	TVA-1203	
C3A	1									
B	2									
C4	800			EF-001	MFT-1000				503C-D1	
C5	800			EF-001	MFT-1000				503C-D1	
C6	10									
C7	6.8			SI6.8NP0	TCZ-6.8	Z013	NP0K-6R8	ZT-5568	5TCCB-V68	
C8	.5-3				829-3		3115-01-0R5	CT565A		
C9	1500			BPD-0015	DD-152	K071	801-0015	DC-5215	5HK-D15	
C10	3			SI3NP0	TCZ-3	Z007	NP0K-030	ZT-5533	5TCCB-V33	
C11	.5-3				829-3		3115-01-0R5	CT565A		
C12	800			EF-001	MFT-1000				503C-D1	
C13	1.5			SI1.5NP0	TCZ-1.5	Z004	NP0K-1R5	ZT-5515	5TCCB-V15	
C14	47			BPD-000047	D6-470	G033	801-470	UC-5447	5GA-Q47	
C15	800			EF-001	MFT-1000				503C-D1	
C16	47									
C17	.5-3				829-3		3115-01-0R5	CT565A		
C18	10			SI10N750	TCN-10	N018	N750K-100	NT-541	5TCU-Q1	
C19	5									
C20	.5-3				829-3		3115-01-0R5	CT565A		
C21	1500			BPD-0015	DD-152	K071	801-0015	DC-5215	5HK-D15	
C22	220			BPD-00022	D6-221	G051	GP2K-221	UC-5322	5GA-T22	
C23	800			EF-001	MFT-1000				503C-D1	
C24	800			EF-001	MFT-1000				503C-D1	
C25	1500			BPD-0015	DD-152	K071	801-0015	DC-5215	5HK-D15	
C26	36		47X626							
C27	47		47X603	SI47	D6-470	G033	GP1K-470	UC-5447	5GA-Q47	
C28A	1000		80X3	BPD-2X001	DD2-102	DK069	812-001	DCD-521	5HK-2D1	
B	1000									
C29	680		80X5	BPD-00068	D6-681	K065	GP2K-681	UC-5368	5GA-T68	
C30	1000		80X1	BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C31A	1000		80X3	BPD-2X001	DD2-102	DK069	812-001	DCD-521	5HK-2D1	
B	1000									
C32	680		80X5	BPD-00068	D6-681	K065	GP2K-681	UC-5368	5GA-T68	
C33	1		47X588	SI1NP0	TCZ-1	TZ03	NP0K-010		5TCCB-V1	
C34	150		RCM15E151K	1469-00015		22R5T15		MCB236		
C35	470		80X4	BPD-00047	D6-471	K060	GP2K-471	UC-5347	5GA-T47	
C36	470		80X4	BPD-00047	D6-471	K060	GP2K-471	UC-5347	5GA-T47	
C37	1000		80X1	BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C38	1000		80X1	BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C39	1000		80X1	BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C40	5		47X562	SI5NP0	TCZ-4.7	TZ07	NP0K-050	ZT-555	5TCCB-V47	
C41	510	500				5R5T51				
C42	.047	400	RCP10M4473M	P488-047	DF-503	CUB4S47		PT4147	4TM-S47	
C43	.1	400	RCP10M4104M	P488-1	DF-104	CUB4P1		PT401	4TM-P1	
C44	1000		80X1	BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	Note 1
C45	1000		80X1	BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	Note 2
C46	.22	200	RCP10M2224M	P488-22		CUB4P22		PT4022	4TM-P22	
C47	.22	200	RCP10M2224M	P488-22		CUB4P22		PT4022	4TM-P22	
C48	.47	200	RCP10M2474M	P288-47		CUB2P47		PT4047	2TM-P47	Note 3
C49	1000		80X1	BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	Note 1
C50	1.5		47X584	SI1.5NP0	TCZ-1.5	TZ0	NP0K-1R5	ZT-5515	5TCCB-V15	
C51A	10000		80X6	BPD-2X01	DD3-103	DK082	811-01	DC-511	5HK-2S1	
B	10000						811-01	DC-511		
C52	100		47X604	SI100	D6-101	TP34	GP1K-101	UC-531	5GA-T1	
C53	5000		47X507	BPD-005	DD-502	K080	811-005	DC-525	5HK-D5	
C54	5000		47X507	BPD-005	DD-502	K080	811-005	DC-525	5HK-D5	
C55	330	500	47X570	1469-00035		5R5T33				
C56	470	500	RCM20B471K	1469-0005		5R5T47		MCB245	MS-35	
C57	.047	400	RCP10M4473M	P488-047	DF-503	CUB4S47		PT4147	4TM-S47	Note 4
C58	330	500	47X570	1469-00035		5R5T33				Note 1
C59	100		47X604	SI100N750	TCN-100	TN22	N750K-100	NT-531	5TCU-T1	Note 1
C60	1000		80X1	BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C61	.047	400	RCP10M4473M	P488-047	DF-503	CUB4S47		PT4147	4TM-S47	

Note 1. Used in chassis with red paint mark on rear of chassis.
Note 2. Chassis with orange paint mark on rear use 4MFD in this application.
Note 3. Used in chassis with orange paint mark on rear of chassis.
Note 4. Chassis not marked with red paint on rear use .01MFD in this application.

PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO

PARTS LIST AND DESCRIPTIONS (Continued)

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA TRUETONE PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	5 5Meg	½	B40X370A	Q11-142	Not Req.	A47-7-.5Meg-S	AB-89	Sync level
B	Shaft		Not Req.	Not Req.	FKS-1/4	AK-4	U-82	Attach to R1A
R2A	2 5Meg	½	B40X369A	Q11-239	A47-2.5Meg-S	AB-83	SU565	AGC
B	Shaft		Not Req.	RQ	FKS-1/4	AK-4	Not Req.	Attach to R2A

RESISTORS

ITEM No.	RATING OHMS	WATTS	REPLACEMENT DATA TRUETONE PART No.	IRC PART No.	NOTES
R3	10KΩ	½		BTS-10K	
R4	1000Ω	½		BTS-1000	
R5	22KΩ	½		BTS-22K	
R6	47KΩ	½		BTS-47K	
R7	270KΩ	½		BTS-270K	
R8	180KΩ	½		BTS-180K	
R9	68ΩΩ	½		BTS-680	
R10	33KΩ	½		BTS-33K	
R11	330ΩΩ	½		BTA-330Ω	
R12	15KΩ	½		BTS-15K	
R13	100KΩ	½		BTS-100K	
R14	100KΩ	½		BTS-100K	
R15	100KΩ	½		BTS-100K	
R16	8200Ω	½		BTS-8200	
R17	10KΩ	½		BTS-10K	
R18	4700Ω	½		BTS-4700	
R19	33000Ω 5%	1	B83332	BTS-3300 5%	
R20	470Ω 5%	1	B83470	BTS-47 5%	
R21	1000Ω	1	B84032	BTS-1000	
R22	470Ω	1	B85471	BTS-470	
R23	39KΩ 5%	1	B83393	BTS-39K 5%	
R24	470 5%	1	B83470	BTS-47 5%	
R25	47ΩΩ	1	B85471	BTS-470	
R26	150Ω	1	B85151	BTS-150	
R27	150Ω	1	B85151	BTS-150	
R28	39KΩ 5%	1	B83393	BTS-39K 5%	
R29	180Ω	1	B84181	BTS-180	
R30	1500Ω	1	B84152	BTS-1500	
R31	3900Ω 5%	1	B83392	BTS-3900 5%	
R32	47KΩ	1	B84472	BTS-47K	

ITEM No.	RATING OHMS	WATTS	REPLACEMENT DATA TRUETONE PART No.	IRC PART No.	NOTES
R33	2700Ω 5%	1	B83272	BTS-2700 5%	
R34	1000Ω	1	B84032	BTS-1000	
R35	5600Ω	1	B84562	BTS-5600	
R36	470KΩ	1	B84474	BTS-470K	
R37	100Ω	1	B84101	BTS-100	
R38	2000Ω 5%	2	D83202		
R39	2000Ω 5%	2	D83202		
R40	1 Meg	½	B84105	BTS-1 Meg	
R41	68KΩ	½	B84683	BTS-68K	
R42	47KΩ	½	B84473	BTS-47K	
R43	330KΩ	½	B84334	BTS-330K	
R44	100KΩ	½	B84104	BTS-100K	
R45	470KΩ	½	B84474	BTS-470K	
R46	3.3Meg	½	B84335	BTS-3.3Meg	
R47	68Ω	1		BTS-68	Note 1
R48	1000Ω	1	B85102	BTS-1000	
R49	56KΩ	1	B84563	BTS-56K	
R50	33KΩ	1	B84333	BTS-33K	
R51	33KΩ	1	B84333	BTS-33K	
R52	1000Ω	1	B85102	BTS-1000	
R53	270Ω	1	B84271	BTS-270	
R54	68KΩ	1	B84683	BTS-68K	
R55	10KΩ 5%	1	B83103	BTS-10K	
R56	10KΩ 5%	1	B83103	BTS-10K	
R57	150KΩ	1	B84154	BTS-150K	
R58	1.5Meg	1	B84155	BTS-1.5Meg	
R59	150KΩ	1	B84154	BTS-150K	
R60	18KΩ	1	C85183	BTA-18K	
R61	390KΩ	1	B84394	BTS-390K	

Note1 Some models may use a 100Ω resistor in this application.

COILS (RF-IF)

ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA TRUETONE PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	NOTES
L1	UHF Ant. Coil	0Ω						
L2	UHFAnt. Coil	0Ω						
L3A	UHF Ant., Mixer, Osc. Coils	0Ω		9A2331-10				Channels 10 thru 19
B	UHF Ant., Mixer, Osc. Coils	0Ω		9A2331-20				Channels 20 thru 29
C	UHF Ant., Mixer, Osc. Coils	0Ω		9A2331-30				Channels 30 thru 39
D	UHF Ant., Mixer, Osc. Coils	0Ω		9A2331-40				Channels 40 thru 49
E	UHF Ant., Mixer, Osc. Coils	0Ω		9A2331-50				Channels 50 thru 59
F	UHF Ant., Mixer, Osc. Coils	0Ω		9A2331-60				Channels 60 thru 69
G	UHF Ant., Mixer, Osc. Coils	0Ω		9A2331-70				Channels 70 thru 79
H	UHF Ant., Mixer, Osc. Coils	0Ω		9A2331-80				Channels 80 thru 83
L4	RF Choke	0Ω						
L5A	Fil. Choke	0Ω						
B	Fil. Choke	0Ω						
L6	Cathode Choke	0Ω						
L7	UHF IF Input Coil	0Ω	.3Ω					
L8	UHF IF Interstage	.3Ω	.1Ω					
L9	UHF IF Interstage	.2Ω						
L10A	VHF Ant. Coil	0Ω		9A2332-2				Channel 2
B	VHF Ant. Coil	0Ω		9A2332-3				Channel 3
C	VHF Ant. Coil			9A2332-4				Channel 4
D	VHF Ant. Coil	0Ω		9A2332-5				Channel 5
E	VHF Ant. Coil	0Ω		9A2332-6				Channel 6
F	VHF Ant. Coil	0Ω		9A2332-7				Channel 7
G	VHF Ant. Coil	0Ω		9A2332-8				Channel 8
H	VHF Ant. Coil	0Ω		9A2332-9				Channel 9
I	VHF Ant. Coil	0Ω		9A2332-10				Channel 10
J	VHF Ant. Coil	0Ω		9A2332-11				Channel 11
K	VHF Ant. Coil	0Ω		9A2332-12				Channel 12
L	VHF Ant. Coil	0Ω		9A2332-13				Channel 13
L11	Mext. Coil	0Ω						
L12A	RF. Mixer Grid, Osc. Coil	0Ω		9A2330-2				Channel 2
B	RF. Mixer Grid, Osc. Coil	0Ω		9A2330-3				Channel 3
C	RF. Mixer Grid, Osc. Coil	0Ω		9A2330-4				Channel 4

COILS (cont)

ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA TRUETONE PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	NOTES
D	RF, Mixer Grid, Osc. Coil	0Ω		9A2330-5				Channel 5
E	RF, Mixer Grid, Osc. Coil	0Ω		9A2330-6				Channel 6
F	RF, Mixer Grid, Osc. Coil	0Ω		9A2330-7				Channel 7
G	RF, Mixer Grid, Osc. Coil	0Ω		9A2330-8				Channel 8
H	RF, Mixer Grid, Osc. Coil	0Ω		9A2330-9				Channel 9
I	RF, Mixer Grid, Osc. Coil	0Ω		9A2330-10				Channel 10
J	RF, Mixer Grid, Osc. Coil	0Ω		9A2330-11				Channel 11
K	RF, Mixer Grid, Osc. Coil	0Ω		9A2330-12				Channel 12
L	RF, Mixer Grid, Osc. Coil	0Ω		9A2330-13				Channel 13
L13	Fil. Choke	0Ω						
L14	Conv. Plate	.1Ω		31K264				
L15	IF trap	.1Ω		9A2300				
L16	1st. Video IF	.1Ω		9A2316				Includes 47.25MC trap
L17	2nd. Video IF	.1Ω	.1Ω	9A2317				2.2 Microhenries
L18	Fil., Choke	0Ω		9A2333	19-1002			6606
L19	3rd. Video IF	.1Ω	.1Ω	9A2318				6333 *
L20	Parasitic Suppressor	0Ω		9A2332				2 turns wire on 10KΩ resistor
L21	Fil. Choke	0Ω		9A2033	19-1002			4606
L22	Cathode Trap	0Ω	0Ω	9A2321				2.2 Microhenries
L23	4th. Video IF	.6Ω	.5Ω	9A2319				6234
L24	Series Peaking Coil	1Ω		36A21	19-4121 ▲			6153
L25	Shunt Peaking Coil	17Ω		36A22	19-3300	TV-185		6155
L26	4.5MC Trap	.3Ω		9A2074	20-1004	TV-181		1470
L27	Series Peaking Coil	12Ω		36A17	19-3160 ■	TV-184 ■		6153 ■
L28	Shunt Peaking Coil	12Ω		36A17	19-3160	TV-184		6153
L29	Shunt Peaking Coil	7Ω		36A19	19-4080			6172
L30	Shunt Peaking Coil	10Ω		36A19	19-3100 †			6153 †
L31	1st Sound IF	2Ω		9A2201	17-1031 ▲	TV-113 ●		6203 ●
L32	2nd Sound IF	2.5Ω	2Ω	9A2323	17-1021 ▲	TV-113		6203
L33	Ratio Det.	3.7Ω	.65CT	9A2295	17-1037	TV-115		6205

* Deluxe trap.
■ Parallel with 15KΩ resistor.
▲ Wound on 6.2KΩ resistor.
† Parallel with 220Ω resistor.
▲ Drill mounting holes.
● Use one winding.

CRYSTAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA TRUETONE PART No.	SYLVANIA PART No.	FEDERAL PART No.	NOTES
M2	1N83		1N83 or 1N83A	1N73A	UHF Mixer

MISCELLANEOUS

ITEM No.	PART NAME	TRUETONE PART No.	NOTES
M3	Dial Light	7A32	#51, Bayonet
M4	Trap	25A1102	VHF-UHF
M5	Trap	31K-225	IF waveform- UHF Ant. Input

SWEEP CHASSIS

TUBES (SYLVANIA, GENERAL ELECTRIC, WESTINGHOUSE)

ITEM No.	USE	REPLACEMENT DATA TRUETONE PART No.	STANDARD REPLACEMENT	RETMA BASE TYPE	NOTES
V15	Audio Amplifier-AGC Clamper	6AV6	6AV6	7BT	
V16	Audio Output	6AQ6	6AQ6	7BZ	
V17	Sync Amp.-Vert. Osc.	6SN7GT	6SN7GT	8BD	
V18	Vert. Output	6S4	6S4	9A	
V19	Horiz. AFC-Horiz. Osc.	6SN7GT	6SN7GT	8BD	
V20	Horiz. Output	6CD6G	6CD6G	5BT	
V21	Damper	6AX4GT	6AX4GT	4CG	
V22	HV Rectifier	1B3GT	1B3GT	3K	
V23	LV Rectifier	5U4G	5U4G	5T	
V24	LV Rectifier	5U4G	5U4G	5T	

CATHODE-RAY TUBE

ITEM No.	REPLACEMENT DATA TRUETONE PART No.	CBS-HYTRON PART No.	GENERAL ELECTRIC PART No.	SYLVANIA PART No.	WESTINGHOUSE PART No.	RETMA BASE TYPE	NOTES
V25	21ZP4B	21ZP4B	21ZP4B	21ZP4B 21ZP4A 21ZP4 ①	21ZP4B	12N 12N 12D	① Circuit changes necessary.

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA TRUETONE PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C62A	.02	350	47X409	AFH-87		D088		FP245	TVL-4747	
B	.02	350						TC3501		
C	.100	50								
C63A	.02	350	47X407	AFH-84		D085		FP245	TVL-4745	
B	.02	350						TC43		
C	.10	50								Note 5
C64	30	400	45X393	PRS450/30		BR3045		TC77	TVA-1711	
C65	20	400	45X393	PRS450/30		BR3065		TC77	TVA-1711	
C66	5	25	47X378	PRS150/4		BR550		TC30	TVA-1203	
C67	.047	500	RCP10M3473M	P388-047	DF-503	CUB2S47		PT4147	2TM-S47	
C68	.0047	600	RCP10M4732M	P388-0047	D6-473	CUB6D47	GP2-333-472	PT6247	6TM-D47	
C69	5000		47X507	BPD-005	DD-502	K080	811-005	DC-525	5HK-D5	
C70	100		47X504	BPD-01	DD-101		GP1K-101	DC-531	5GA-T1	
C71	.22	400	RCP10M4224M	P488-22		CUB4P22		PT4P22	4TM-P22	
C72A	.01									
B	.250		†76EX5	†PA-122-3	†PC-80	†1137M1	†1404-01		†T-1	
C										
C73	.01	400	RCP10M0103M	P488-01	D6-103	CUB4S1	GP2-333-103	PT4Ll	4TM-S1	
C74	.0047	600	RCP10M6473M	P688-0047	D6-472	CUB6D47	GP2-333-472	PT6247	6TM-D47	
C75A	.002							PT622		
B	.005		†76EX7	†PA-110	†PC-100	†1157M1	†1405-01	PT625	†V-1	
C	.005							PT625		
C76	4700	500	RCM30B472J	1456-005		1R5D47			MS-35	
C77	470	500	RCM20B471K	1469-0005		SR5T47			MS-35	
C78	.01	400	RCP10M1033M	P488-01	D6-103	CUB4S-	GP2-333-103	PT4Ll	4TM-S1	
C79	.047	400	RCP10M4733M	P488-047	DF-503	CUB4S47		PT4147	4TM-S47	
C80	.047	200	RCP10M2473M	P288-047	DF-503	CUB2S47		PT4147	2TM-S47	
C81	.047	600	RCP10M6473M	P688-047	DF-503	CUB6S47		PT6147	6TM-S47	
C82	.1	600	RCP10M6104M	P688-1	DF-104	CUB6P1		PT601	6TM-P1	
C83	.047	600	RCP10M6473M	P688-047	DF-503	CUB6S47		PT6147	6TM-S47	
C84	.015	600	RCP10M6153M	P688-015		CUB6S15		PT6Ll5	6TM-S15	
C85	.1	200	RCP10M2104M	P288-1	DF-104	CUB2P1		PT401	2TM-P1	
C86	.1	600	RCP10M6104M	P688-1	DF-104	CUB6P1		PT601	6TM-P1	
C87	18	500	RCM20B181K	1469-00002		2ZR5Q18			MS-43	Note 6
C88	220	500	RCM20B221K	1469-00025		2ZR5T22				Note 7
C89	47	500	RCM10B470K	1469-00005		2ZR5Q47			MS-45	
C90	82	500	RCM20B820K			2ZR5Q82				
C91	.047	400	RCP10M4733M	P488-047	DF-503	CUB4S47		PT4147	4TM-S47	
C92	.47	400	RCP10M4474M	P488-47		CUB4S47		PT4047	4TM-S47	
C93	.047	200	RCP10M2473M	P288-047	DF-503	CUB2S47		PT4147	2TM-S47	
C94	.022	200	RCP10M2223M	P488-022	DF-205	CUB4S22	617-02	PT4122	4TM-S22	
C95	330	500	RCM20B331K	1469-00035		SR5T33				
C96	.01	400	RCP10M1033M							
C97	.1	400	RCP10M4104M	P488-1	DF-104	CUB4P1		PT401	4TM-P1	
C98	820	500	RCM25B821K			SR5T82				
C99	.0022	400	RCP10M4222M	P488-0022	D6-222	CUB4D22	GP2-333-223	PT4223	6TM-D22	
C100	.1	400	RCP10M4104M	P488-1	DF-104	CUB4P1		PT401	4TM-P1	
C101	1000	1000	47X505							
C102	.047	400	RCP10M4473M	P488-047		CUB4S47		PT4147	4TM-S47	
C103	.047	400	RCP10M4473M	P488-047		CUB4S47		PT4147	4TM-S47	
C104	500	30000	47X507		TVB-503	MMU30T5				
C105	.1	400	RCP10M4104M	P488-1	DF-104	CUB4P1		PT401	4TM-P1	
C106	10000		47X515	BPD-01	DD-103	K082	811-01	DC-511	5HK-81	
C107	10000		47X515	BPD-01	DD-103	K082	811-01	DC-511	5HK-81	

Note 5. Some models use 40MFD in this application.
Note 6. Chassis not marked with orange paint on rear use 36MMF in this application.
Note 7. C88 used only in chassis marked with orange paint on rear of chassis.
† Items C72A, C72B, C72C, R72A, R72B are combined in one unit.
When replacing items separately C72B and C72C should total 250MMF.
● Items C75A, C75B, C75C, R76A, R76B, R76C are combined in one unit.

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA TRUETONE PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	INSTALLATION NOTES
R62A	1200Ω	½	B75X18D		RTV-485	P1-7	UP152R	Contrast-Panel
B	1 Meg	½				R2-57	UR16-T25	Volume Rear Tapped at 300K
C	Switch					KB-2	US-37	Attach to R62B
R63A	50KΩ	½	B40X374	Q11-123	A47-50K-S	AB-31	U-35	Horiz. Hold
B	Shaft		Not Req.	Not Req.	KSS-3	AK-4	Not Req.	Attach to R63A
R64A	8000Ω	½	B40X375	Q11-116	A47-10K-S	AB-14	SU-20	Vert. Linearity
B	Shaft		Not Req.	RQ	FKS-1/4	AK-4	Not Req.	Attach to R64A
R65A	1.5Meg	½	B40X373	Q11-138	A47-1.5Meg-S	AB-75	U-155	Tone
B	Shaft		Not Req.	Not Req.	KSS-3	AK-4	Not Req.	Attach to R65A
R66A	100KΩ	½	B40X372A	Q11-128	A47-100K-S	AB-60	U-61	Brightness
B	Shaft		Not Req.	Not Req.	KSS-3	AK-4	Not Req.	Attach to R66A
R67A	2.5Meg	½	B40X366A	Q11-210	A47-2.5Meg-S	BX-63	SU-565	Height
B	Shaft		Not Req.	RQ	FKS-1/4	Not Req.	Not Req.	Attach to R67A
R68A	1.5Meg	½	B40X373	Q11-138	A47-1.5Meg-S	AB-75	U-155	Vert. Hold
B	Shaft		Not Req.	Not Req.	KSS-3	AK-4	Not Req.	Attach to R68A
R69A	50KΩ	½	B40X374	Q11-123	A47-50K-S	AB-31	U-35	Horiz. Drive
B	Shaft		Not Req.	Not Req.	KSS-3	AK-4	Not Req.	Attach to R69A

TRUETONE MODEL 2D1431A

PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS

ITEM No.	RATING OHMS	RATING WATT	REPLACEMENT DATA TRUETONE PART No.	REPLACEMENT DATA IRC PART No.	NOTES
R70	68KΩ	½		BTS-68K	
R71	10 Meg	½	B85106	BTS-10Meg	
R72A	470KΩ	½	† 76X5	BTS-470K	
B	470KΩ	½		BTS-470K	
R73	47KΩ	½	B85473	BTS-47K	
R74	330Ω	1	C84331	BTA-330	
R75	1000Ω	2	D84102	BTB-1000	
R76A	22KΩ	½	♦ 76X7	BTS-22K	
B	8200Ω	½		BTS-8200	
C	8200Ω	½		BTS-8200	
R77	3300Ω	½	B84332	BTS-3300	
R78	1.5Meg	½	B84155	BTS-1.5Meg	
R79	1.5Meg	½	B84155	BTS-1.5Meg	
R80	180KΩ	½	B84184	BTS-180K	
R81	2.2Meg	½	B84225	BTS-2.2Meg	
R82	15KΩ	½	B84153	BTS-15K	
R83	1.8Meg	½	B84185	BTS-1.8Meg	
R84	820Ω	2	D84821	BTB-820	
R85	3300Ω	1	C84332	BTA-3300	
R86	2200Ω	½	B84222	BTS-2200	
R87	10KΩ	½	B85103	BTS-10K	
R88	100KΩ	½	B85104	BTS-100K	
R89	22KΩ	½	B84223	BTS-22K	
R90	1.2Meg	½	B84125	BTS-1.2Meg	
R91	220KΩ	½	B84224	BTS-220K	
R92	330Ω	2		BTS-330	
R93	330Ω	2		BTS-330	
R94	5600Ω	½	B85562	BTS-5600	

ITEM No.	RATING OHMS	RATING WATT	REPLACEMENT DATA TRUETONE PART No.	REPLACEMENT DATA IRC PART No.	NOTES
R95	820KΩ	½	B84824	BTS-820K	Note 2
R96	10KΩ	1	C84103	BTA-10K	Note 3
R97	3300Ω	½	B84332	BTS-3300	
R98	330KΩ	½		BTS-330K	
R99	82KΩ	½	B84823	BTS-82K	
R100	150KΩ	½		BTS-150K	
R101	330KΩ	½		BTS-330K	
R102	8200Ω	½	B84822	BTS-8200	
R103	3900Ω	½	B84392	BTS-3900	
R104	120KΩ	½	B84124	BTS-120K	
R105	47KΩ	½	B85473	BTS-47K	
R106	820KΩ	½		BTS-820K	
R107	82KΩ	½	B84823	BTS-82K	
R108	82KΩ	½	B84823	BTS-82K	
R109	82KΩ	1	C84823	BTA-82K	
R110	470KΩ	½		BTS-470K	
R111	1000Ω	½	B85101	BTS-100	
R112	150Ω	5	43X280	PW7-150	
R113	47Ω	½	B85470	BTS-47	
R114	22KΩ	2	D84223	BTB-22K	
R115	18KΩ	2	D84183	BTB-18K	
R116	3.9Ω	1	43X251		
R117	1 Meg	½	C85105	BTS-1 Meg	
R118	7500Ω	5	43X284	1 3/4A-7500	
R119	1000Ω	15	43X281	2D-1000	
R120	160Ω	10	43X282		
R121	100KΩ	2	D85104	BTB-100K	
R122	270KΩ	½	B85274	BTS-270K	

† Items R72A, R72B, C72A, C72B, C72C are combined in one unit.
♦ Items R76A, R76B, R76C, C75A, C75B, C75C are combined in one unit.
Note 2. Chassis not marked with orange paint on rear use 3900Ω in this application.
Note 3. Chassis not marked with orange paint on rear use 4700Ω in this application

TRANSFORMER (POWER)

ITEM No.	RATING PRI.	RATING SEC. 1	RATING SEC. 2	TRUETONE PART No.	Stancor PART No.	Merit PART No.	Triad PART No.	RCA TYPE No.	Halldorson PART No.	Thordarson PART No.
T1	117VAC @ 2.16A	554VCT . 300ADC	5VAC @ 6A	53X336	P-8167① ②				P9739① ②	
	SEC. 3	SEC. 4	SEC. 5							
	6.3VAC @ 11.3A									

① Drill new mounting hole.
② Parallel and phase 6.3V @ 4.5A and 8.5A windings for Sec. # 3.

TRANSFORMERS (SWEEP CIRCUITS)

ITEM No.	USE	TRUETONE PART No.	Stancor PART No.	Merit PART No.	Triad PART No.	RCA TYPE No.	Halldorson PART No.	Thordarson PART No.
T2	Vert. Osc. Trans.	54X9	A-8125	A-3003	A-97X	209T1 ①	B6702	24A87 ①
T3	Horiz. Output Trans.	53X338 ⑩	A-8232* ②	HV0-9 *	D-19 *	230T1 *	FB411 *	FLY-8 *②
T4	Vert. Output Trans.	51X156	A-8141	A-3039	A-104X	226T1	Z1806	26S54
T5A	Yoke-Horiz. (13MH)	9A2327-2 ③	DY-9A④	MDF-72④	Y-17 ④	209D1 ④	DF602 ④	Y-4 ④
B	Vert. (38MH)							
T6	Horiz. Linearity (1.4-8MH)	9A2293	WC-8	MWC-6⑤	WC-12 ⑥	213R1		WC-18 ⑤
T7	Width (3.8-28MH)	9A2292	WC-5⑥⑦	MWC-1⑥ ⑦	WC-11⑥⑦	215R1 ⑦	RF800⑦⑧	WC-20⑦⑨

① Drill one new mounting hole.
② Drill new mounting holes.
③ Includes R92, R93 and eight prong male plug.
④ Use original yoke network.
⑤ Enlarge mounting hole.
⑥ Connect to coded blue and red terminals.
⑦ Use original slider and core or drill new mounting hole.
⑧ Connect to coded #1 and #2 terminals.
⑨ Connect to coded #3 and #4 terminals.
⑩ Early productions use part #53X337 which is now obsolete when replacing with part #53X338. Remove two 83MMF capacitors from yoke socket and connect 5600Ω resistor to center-tap of horizontal winding as shown on schematic.

*HORIZONTAL OUTPUT TRANSFORMER CONNECTION DATA

Use Original Width Coil Unless Replacement Type Is Listed

	ORIGINAL TERMINAL CONNECTIONS	Stancor Replacement Connections	Merit Replacement Connections	Triad Replacement Connections	RCA Replacement Connections	Halldorson Replacement Connections	Thordarson Replacement Connections
	9	2	9	9	9	9	2
	8	7 & 5	8	8 & 7	8	8	4
	7	7 & 5	5	5	5	5	8
	6	4	NC	NC	NC	NC	7
	4	4	4	4	4	4	7
	T	6	T	T	T	T	6
	3	6	3	3	3	3	6
	1	8	1	1	1	1	5
Connect Width Coil Across →	3 & 1	6 & 8	3 & 1	3 & 1	3 & 1	3 & 1	6 & 5
Special Notes →			⑪	⑪	⑪	⑪	

⑪ Connect a 56MMF Cap. from terminal #5 to open end of R94 (original terminal #6 connection).

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PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	TRUETONE PART No.	Stancor PART No.	Merit PART No.	Triad PART No.	Halldorson PART No.	Thordarson PART No.	
T8	5.2KΩ	3.4Ω	51X65A	A-3849	A-3019	S-5Z	Z1006	26S49	

SPEAKER

ITEM No.	RATINGS			REPLACEMENT DATA			NOTES
	SIZE	FIELD	V. C. IMP.	TRUETONE PART No.	JENSEN PART No.	QUAM PART No.	
SP1	8"	PM	3.4Ω	12A518	ST-115 Mod. P8-V	8A21	

COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA				NOTES
		PRI.	SEC.	TRUETONE PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L34	Horiz. Osc.	80Ω		9A2294	20-1401	TV-161	6182	Waveform winding 55Ω
L35	RF Choke	.8Ω		35A11	19-1000		4602	1 Microhenry; IRC Part No. CLA

FILTER CHOKE

ITEM No.	RATINGS			REPLACEMENT DATA					
	TOTAL DIRECT CURRENT	D. C. RESISTANCE	INDUCTANCE (0 CURRENT 1000 ∿)	TRUETONE PART No.	Stancor PART No.	Merit PART No.	Triad PART No.	Halldorson PART No.	Thordarson PART No.
L36	.300ADC	43Ω	1.76HY	52X94	C-2326	C-2996	C-17X	C5037	26C44 ①

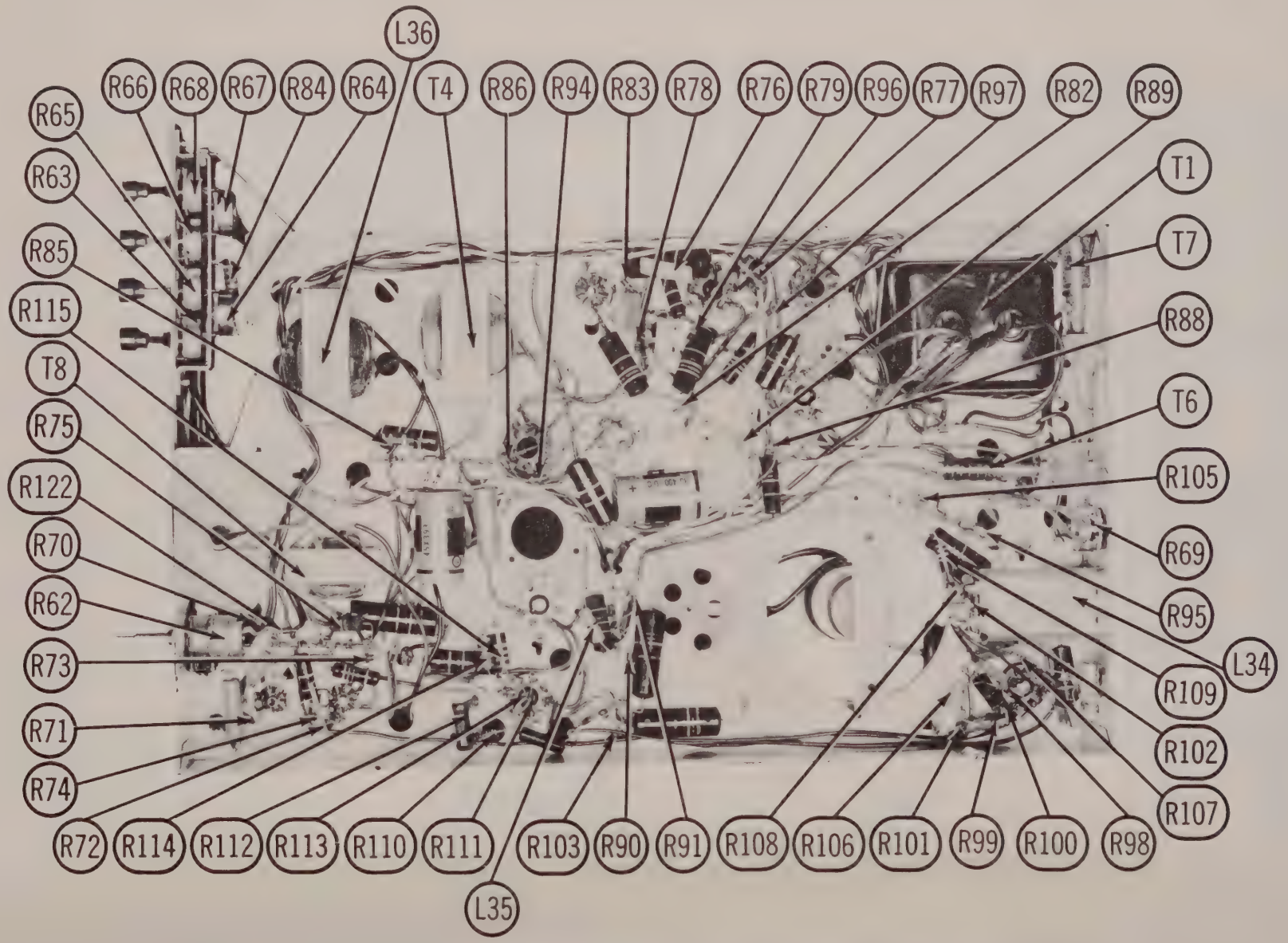
① Drill one new mounting hole.

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			TRUETONE PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M1	3AG Slo-Blo	4/10 A 125V	16X147-3	16X146	313.400 (4/10A-3AG Slo-Blo)	357001	MDL 4/10	4405

MISCELLANEOUS

ITEM No.	PART NAME	TRUETONE PART No.	NOTES
M6	Focus Magnet	2A438	Includes centering device
M7	Ion Trap	2A407	
B3	Trimmer	17A268	6-75MMF (Horiz. Locking Range)
	Knob	10A826	Red- Secondary Controls (4 used)
	Knob	10A827-2	Red - Fine tuning
	Knob	10A831-1	Contrast
	Knob	10A830-1	On/off/volume
	Knob	10A828-1	Channel Selector - VHF
	Knob	10A839-1	Channel Selector - UHF
	Safety Glass	17X180	
	Mask	4X1230-1	



SWEEP CHASSIS BOTTOM VIEW-RESISTOR AND INDUCTOR IDENTIFICATION

TROUBLE SHOOTING AIDS (cont)

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POWER

DEAD SET

If filaments fail to light check AC interlock assembly. Check switch on volume control and T1. If filaments light check by substitution V23 and V24. Check M1 fuse. Check B+ filter and decoupling network for component failure or change of value.

SMALL AND/OR DIM PICTURE

Check by substitution V23 and V24. Check B+ filter and decoupling network.

HIGH VOLTAGE

LOSS OF HIGH VOLTAGE

Check by substitution V19, V20, V21 and V22. Check waveform W16.

If Satisfactory	If Unsatisfactory
Check T3, T5A, T6, T7, R114, R115, C100, C103, C102 and other associated components.	Check L34, R105, R63, R104, R109, C98, C96, C93 and other associated components.

INSUFFICIENT HIGH VOLTAGE

Check by substitution V20, V21, V22, V23 and V24. Check C99, C66, R114, R115, R109 and other associated components.

BLOOMING

Check by substitution V20, V21, V22, V23 and V24. Check C99, R117, R112, C66 and other associated components.

GENERAL

RASTER, SOUND, NO PICTURE

Follow procedure outlined under "Loss of Video".

RASTER, PICTURE, NO SOUND

Follow procedure outlined under "Weak or No Sound".

RASTER, NO SOUND, NO PICTURE

Check by substitution V2, V3, V4, V5, V6, V7, V8 and V9. Check video IF components for failure or change of value.

NO RASTER, NO SOUND

Follow procedure outlined under "Dead Set".

KEYSTONE EFFECT

Check T5 and its associated components.

INTERMITTENT STREAKS

Check high voltage section for corona discharge and arcing.

Symptoms shown are assumed and are not indicative of the quality and workmanship of this equipment.

SERVICING IN THE FIELD

TUNER OSCILLATOR ADJUSTMENTS

Touch-up adjustment of the VHF tuner oscillator circuit may be accomplished as follows:

1. Set the selector knob to VHF position.
2. Tune in a TV station and set the fine tuning control to the center of its range.
3. Remove the channel selector and fine tuning knobs.
4. Adjustments are accessible one at a time thru the small hole above and slightly to the left of the channel switch shaft.

To adjust the UHF oscillator, set the channel selector knobs to the desired UHF channel. The fine tuning knob should be at the center of its range. Remove knobs and adjust the oscillator slug, thru the same hole as for VHF adjustments.

If two UHF channels are received and use the same UHF coil strips, the oscillator should be set for the channel closest to the center of the group.

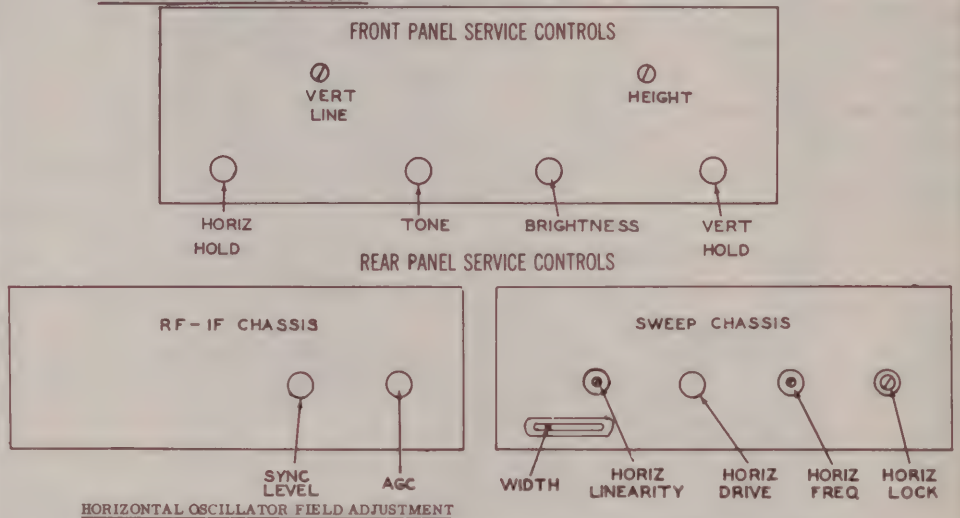
PICTURE TUBE SAFETY GLASS CLEANING

To clean safety glass, remove 5 wood screws holding metal strip at top of safety glass. Remove metal strip and safety glass. (Use extreme caution when removing safety glass).

PICTURE TUBE REMOVAI

For picture tube removal it is necessary to remove chassis. (See disassembly instructions).

SERVICE ADJUSTMENT LOCATION



HORIZONTAL OSCILLATOR FIELD ADJUSTMENT

Adjustment of the Horiz. Oscillator Circuit can be made from the rear panel of the chassis. Set the Horiz. Hold Control at the Mid-position of its range and adjust the Horiz. Frequency slug (L34) until the picture synchronizes horizontally.

SOUND IF DETECTOR BUZZ ADJUSTMENT

To eliminate sound IF detector buzz, adjust the ratio detector secondary (L33) located on top of chassis. (See tube placement chart).

FUSES

One fuse is used for L.V. power protection. (For location see tube placement chart).

CENTERING

Centering is accomplished mechanically by means of a centering lever on the PM focusing assembly. Adjust the centering lever from side to side, and up and down until the picture is properly centered.

DISASSEMBLY INSTRUCTIONS

1. Remove 5 push-on type control from front panel.
2. Remove 2 wood screws and 2 metal screws. Remove rear cover.
3. Loosen 2 wood screws from each of the 2 antenna brackets. Remove brackets.
4. Disconnect speaker leads.
5. Remove 4 speaker nuts. Remove speaker.
6. Disconnect grounding leads (2) from yoke and between chassis.
7. Disconnect deflection yoke from chassis, hi-voltage lead, picture tube socket.
8. Disconnect chassis interconnecting cable.
9. Disconnect shielded audio lead from RF chassis, dial light leads (2), and lead from picture tube socket to RF chassis.
10. Remove 5 chassis bolts from RF chassis. Remove RF chassis.
11. Remove 5 chassis bolts from deflection chassis. Remove deflection chassis.

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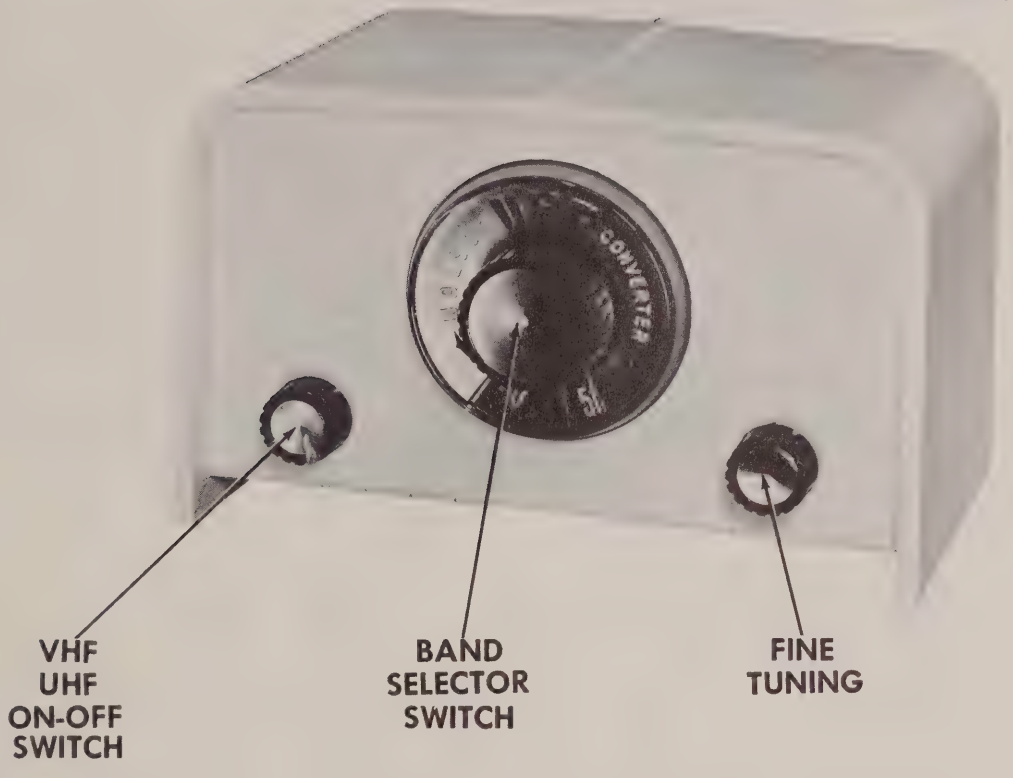
WALSCO
MODEL 2000 (UHF Conv.)



WALSCO
MODEL 2000 (UHF Conv.)

TRADE NAME	Walsco Model 2000		
MANUFACTURER	Walsco Electronics Corp., 3602 Crenshaw Blvd., Los Angeles 16, Calif.		
TUBE SET	AC Operated All Channel UHF Converter, Types 6AF4 Osc., 6BK7 IF Amp.		
TUBES	Two		
POWER SUPPLY	110-120 Volts AC - 60 Cycles	RATING	.16 Amp. @ 117 Volts AC
TUNING RANGE	Channels 14-83		

ALIGNMENT OF THE UHF CONVERTER IS NOT RECOMMENDED IN THE FIELD. IF ALIGNMENT SHOULD BECOME NECESSARY THE ENTIRE CONVERTER UNIT SHOULD BE RETURNED TO THE FACTORY.

HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

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PARTS LIST AND DESCRIPTIONS

WALSCO MODEL 2000

TUBES (SYLVANIA, GENERAL ELECTRIC, WESTINGHOUSE)

ITEM No.	USE	REPLACEMENT DATA: WALSCO PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RETMA BASE TYPE	NOTES
V1	UHF Oscillator	6AF4	6AF4	7DK	
V2	IF Amplifier	6BK7	6BK7	9AJ	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: WALSCO PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C1A	20	150		PRS160/20-20		BBRD2215		2N509	TVA-2428	
B	20	150								
C2	2.2			SI2. 2NP0	TCZ-2.2	TZ05	NP0K-2R2		5TCCB-V22	
C3	2.2			SI2. 2NP0	TCZ-2.2	TZ05	NP0K-2R2		5TCCB-V22	
C4	2-5				829-6		3139-01-10	CT552		
C5	2-5				829-6		3139-01-10	CT552		
C6	800			EF-001	MFT-1000				503C-D1	
C7	800			EF-001	MFT-1000				503C-D1	
C8	5									
C9	5			SI5NP0	TCZ-4.7	TZ07	NP0K-050	ZT-555	5TCCB-V47	
C10	1000			BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C11	1000			BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C12	120			SI120	D6-121	TP35	GP2K-121	UC-5312	5GA-T12	
C13	1000			BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C14	1000			BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	

RESISTORS

ITEM No.	RATING: OHMS	RATING: WATT	REPLACEMENT DATA: WALSCO PART No.	REPLACEMENT DATA: IRC PART No.	NOTES
R1	10KΩ	1/2		BTS-10K	
R2	47Ω	1/2		BTS-47	
R3	47Ω	1/2		BTS-47	

ITEM No.	RATING: OHMS	RATING: WATT	REPLACEMENT DATA: WALSCO PART No.	REPLACEMENT DATA: IRC PART No.	NOTES
R4	47Ω	1/2		BTS-47	
R5	560Ω	1/2		BTS-560	
R6	47Ω	1			

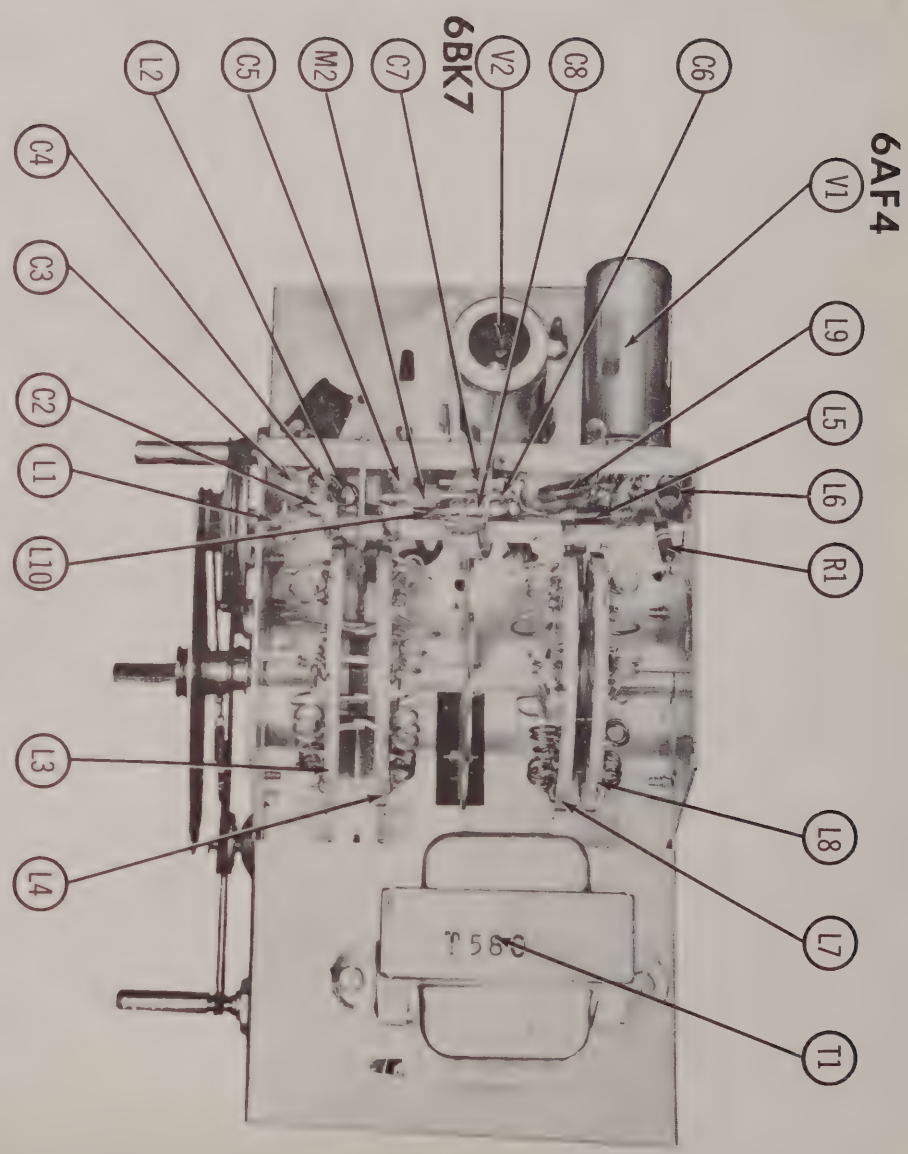
TRANSFORMER (POWER)

ITEM No.	RATING: PRI.	RATING: SEC. 1	RATING: SEC. 2	RATING: SEC. 3	REPLACEMENT DATA: WALSCO PART No.	Stancor PART No.	Merit PART No.	Triad PART No.	Halldorson PART No.	Thordarson PART No.
T1	117VAC .16A	115VAC .047A Tap ⓐ 6.3VAC ⓑ .63A								

COILS (RF-IF)

ITEM No.	USE	DC RES.: PRI.	DC RES.: SEC.	REPLACEMENT DATA: WALSCO PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	NOTES
L1	UHF Ant. Coil	0Ω						
L2	UHF Ant. Coil	0Ω						
L3	UHF Ant. Coil	0Ω						
L4	UHF Mixer Coils	0Ω						
L5	Fil. Choke	.5Ω						
L6	Cathode Choke	0Ω						
L7	UHF Osc. Coils	0Ω						

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

COILS (cont)

ITEM No.	USE	DC RES.		REPLACEMENT DATA				NOTES
		PRI.	SEC.	WALSCO PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L8	UHF Osc. Coils	0Ω						
L9	RF Choke	1.3Ω						
L10	RF Choke	0Ω						
L11	UHF IF Input Coil	0Ω	0Ω					
L12	RF Choke	1.3Ω						
L13	RF Choke	0Ω						
L14	Fil. Choke	0Ω						
L15	UHF IF Output Coil	0Ω	0ΩCT					

SELENIUM RECTIFIER

ITEM No.	RATING	REPLACEMENT DATA						NOTES
	CURRENT	WALSCO PART No.	FEDERAL PART No.	INTERNATIONAL PART No.	MALLORY PART No.	SARKES TARZIAN PART No.	SELETRON PART No.	
M1	.047A		1002A	RS65	6S65	65	8J1	

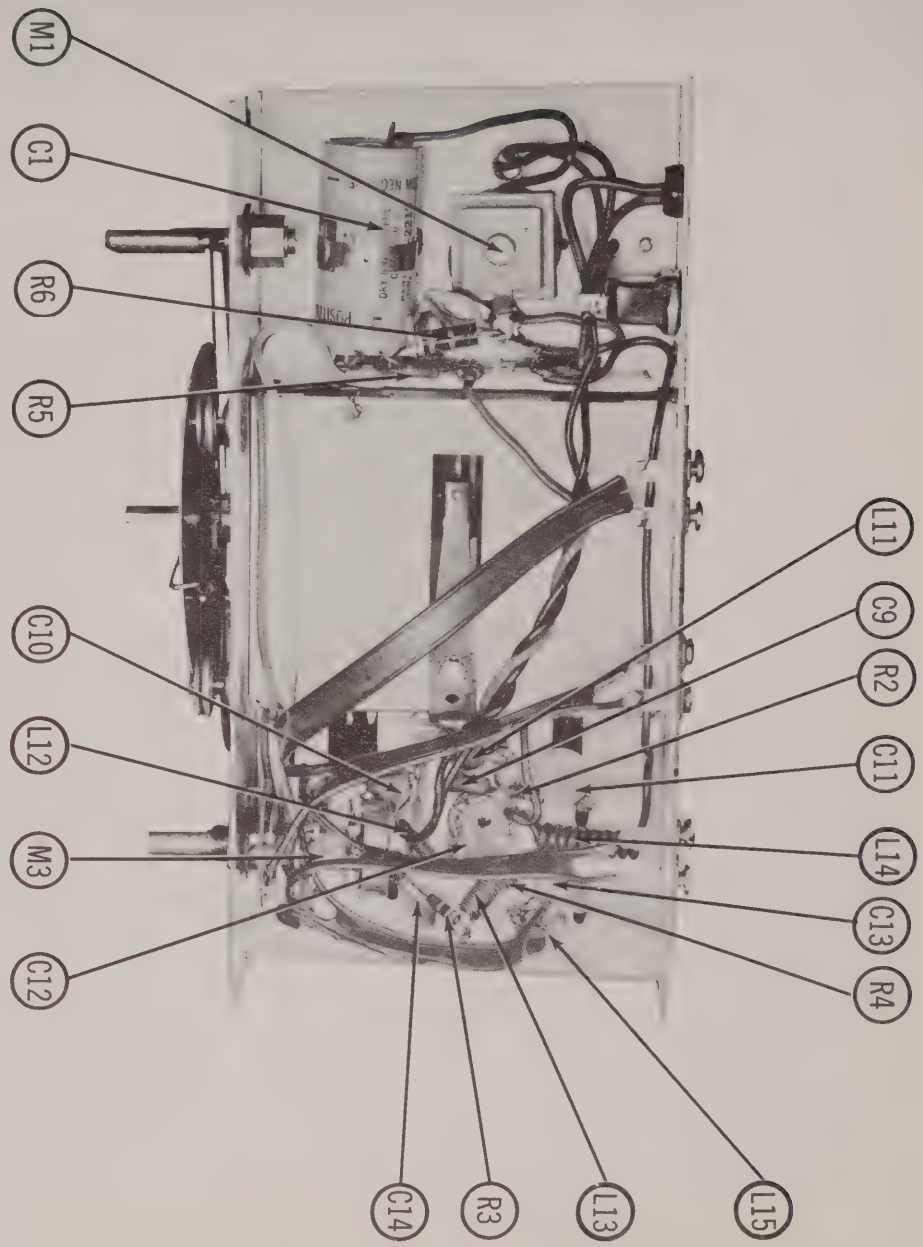
CRYSTAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA			NOTES
		WALSCO PART No.	SYLVANIA PART No.	FEDERAL PART No.	
M2	1N82		1N82 or A		UHF Mixer (pigtail)

MISCELLANEOUS

ITEM No.	PART NAME	WALSCO PART No.	NOTES
M3	Switch		UHF-VHF Chargeover & Off-On

CHASSIS—BOTTOM VIEW



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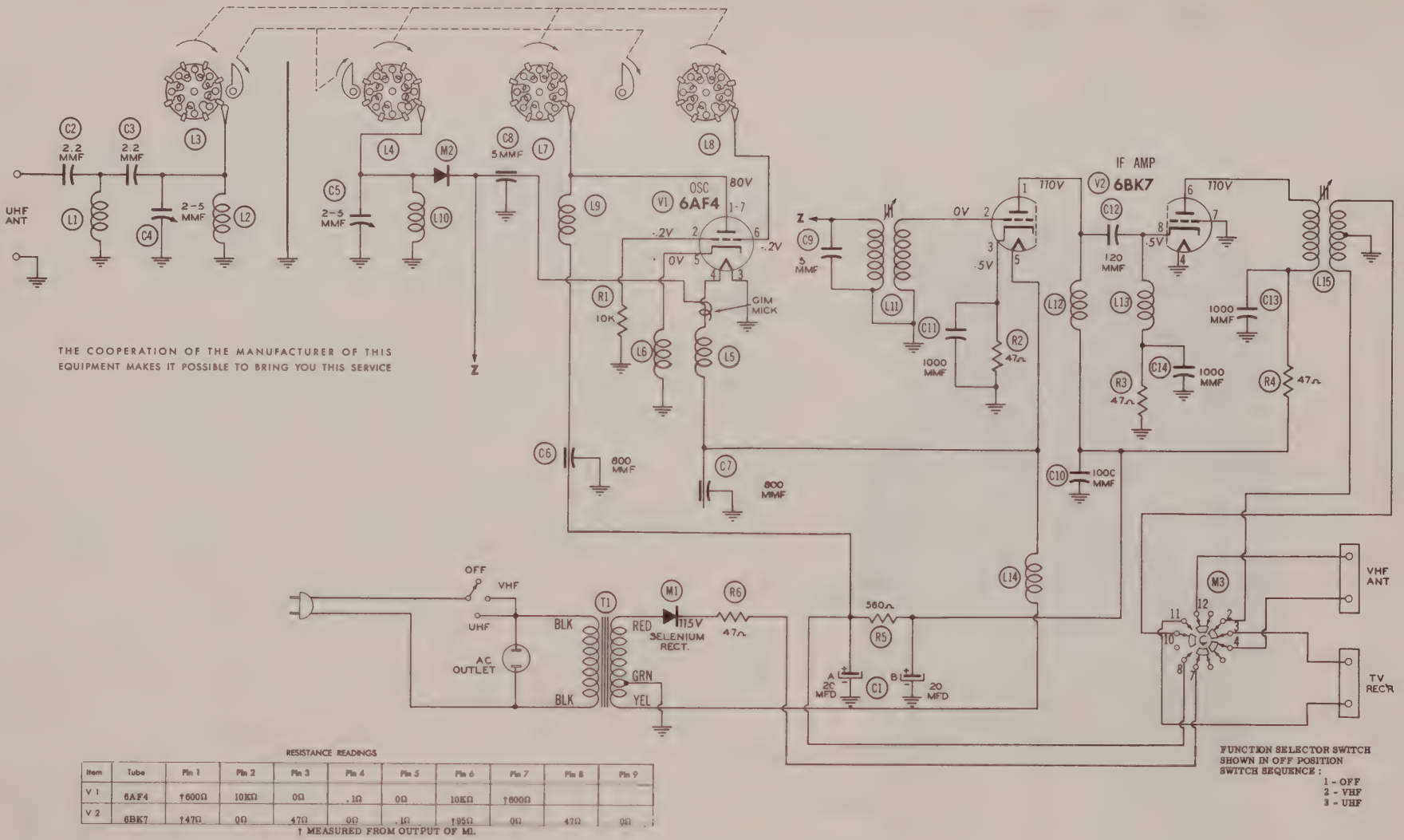
WALSCO MODEL 2000



RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6AF4	†600Ω	10KΩ	0Ω	.1Ω	0Ω	10KΩ	†600Ω		
V 2	6BK7	†47Ω	0Ω	47Ω	0Ω	.1Ω	†95Ω	0Ω	47Ω	0Ω

† MEASURED FROM OUTPUT OF M1.

FUNCTION SELECTOR SWITCH SHOWN IN OFF POSITION
SWITCH SEQUENCE :
1 - OFF
2 - VHF
3 - UHF

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.

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ZENITH MODEL M2237R

TRADE NAME	ZENITH	MODELS	CHASSIS
		M2237R, M2260R, M2261E, M2267Y	20M20
		M2237EU, M2237RU, M2260RU, M2261EU, M2267YU	20M20U
		M2260RUZ	20M20UZ
		M2237EZ, M2237RZ, M2260RZ, M2261EZ, M2267YZ	20M20Z

MANUFACTURER	Zenith Radio Corp., 6001 Dickens Ave., Chicago 39, Ill.
TYPE SET	Television Receiver
TUBES	Twenty
POWER SUPPLY	110-120 Volts AC-60 Cycle RATING 2.04 Amp. @ 117 Volts AC
TUNING RANGE	Channels 2 thru 13 VHF, 14 thru 83 UHF, Video IF 45.75MC, Sound IF 41.25MC (Intercarrier)

INDEX

Alignment Instructions 6, 7
Drive Cord Stringing (Fine tuning) 23
Disassembly Instructions 23
Horizontal Sweep Circuit Adjustments 11
Parts List and Descriptions ..... 13 thru 18
Photographs
Cabinet-Rear View 11
Capacitor Identification 4, 9
Chassis-Top View 3
RF Tuner 10, 21
Resistor Identification 14, 19
Photographs (Cont)
Trans., Inductor & Alignment Identification 20
Resistance Measurements 8
Servicing in the Field 22
Schematic (Alternate Tuner) 13
Schematic (TV) 2
Trouble Shooting Aids 12, 21
Tube Failure Check Chart 5
Tube Placement Chart (Bottom View) 8
Tube Placement Chart (Top View) 5

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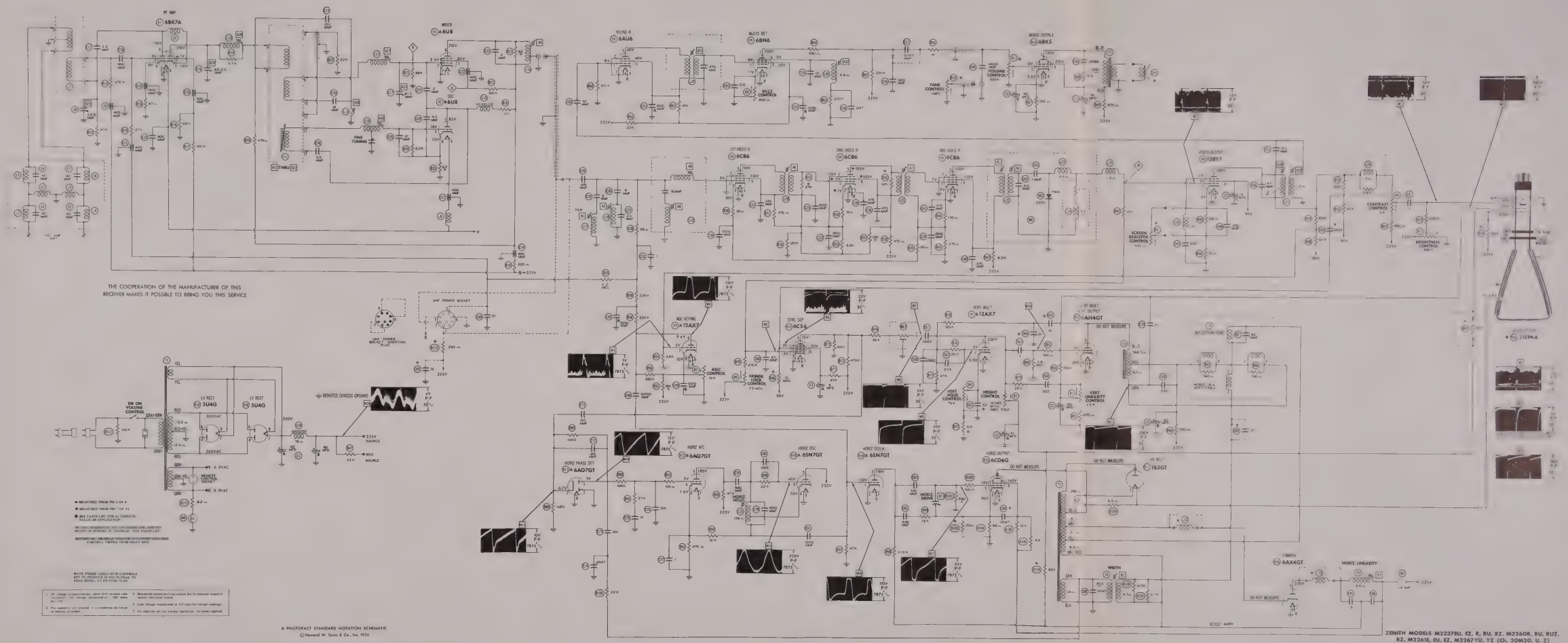
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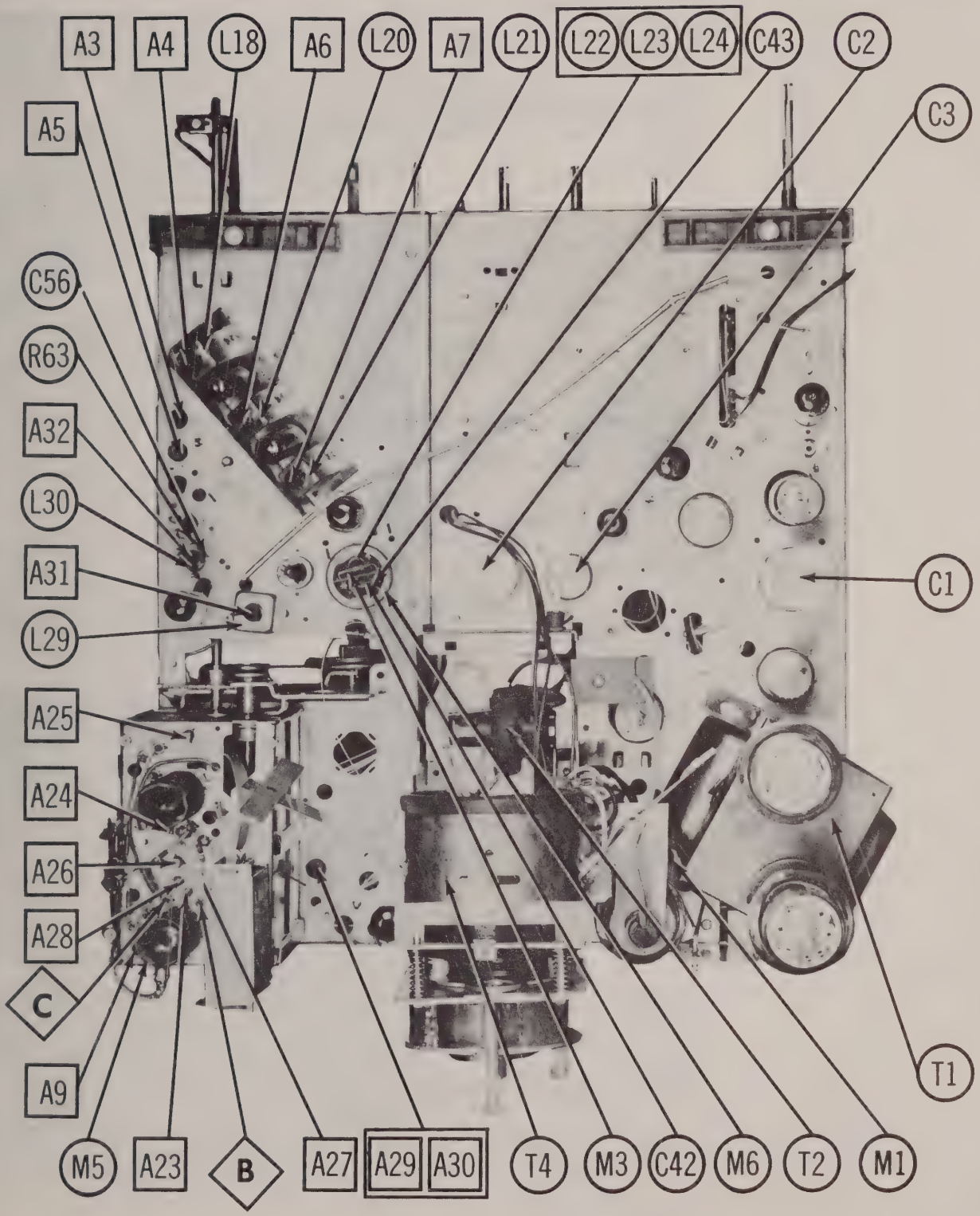

CHASSIS TOP VIEW

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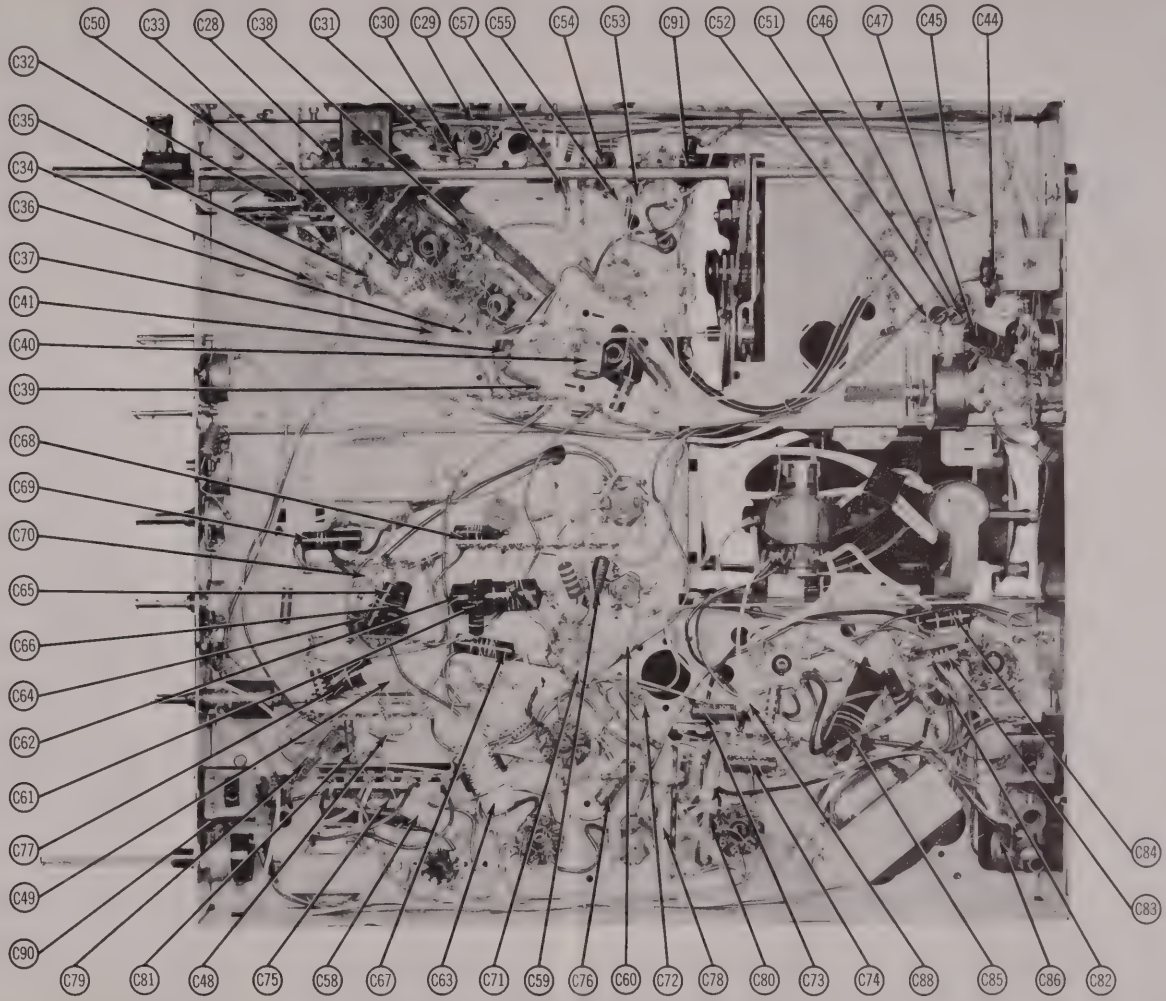

CHASSIS BOTTOM VIEW-CAPACITOR IDENTIFICATION

TUBE PLACEMENT CHART

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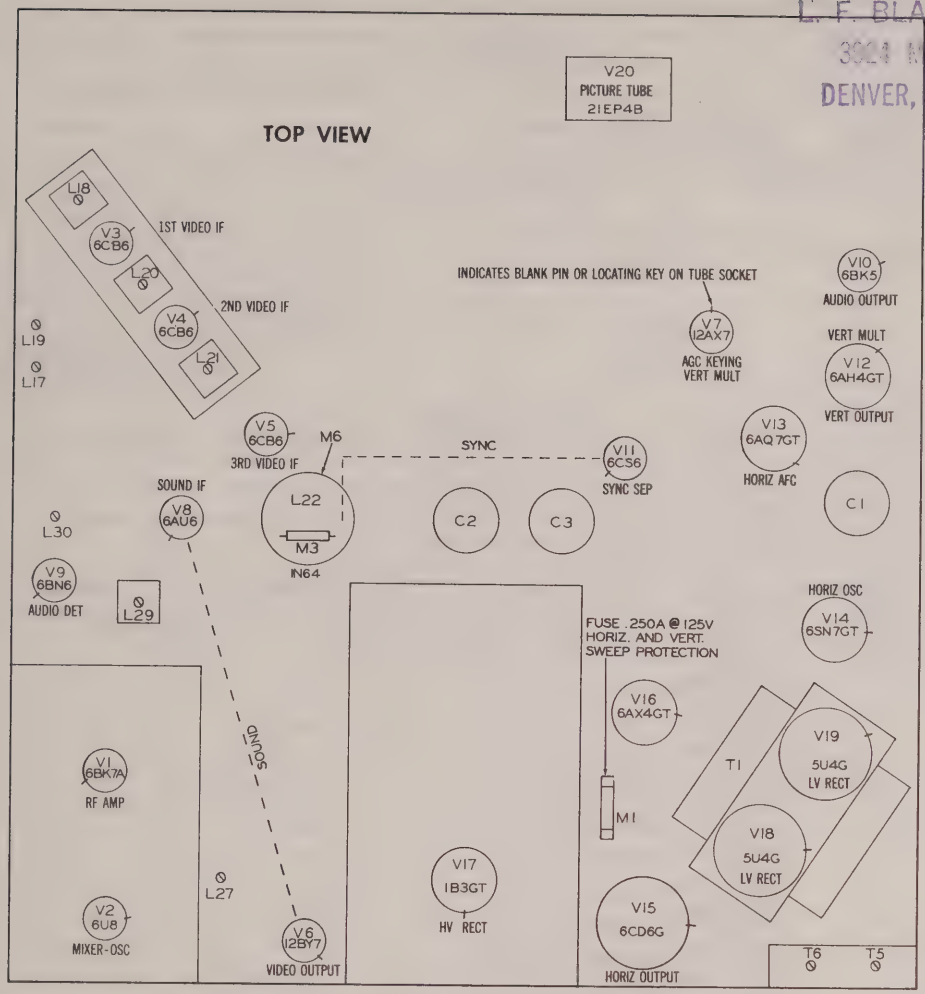

TUBE FAILURE CHECK CHART

The following chart lists tubes whose failures are most likely to produce the indicated symptoms. Refer to tube placement chart for location and type of tube.

POWER SUPPLY FAILURE
No raster, no sound - V18, V19

LOSS OF PICTURE OR SOUND
No pic, no sound, has raster - V2, V3, V4, V5, V6
No pic, no sound, has snow - V1, V2, V3
No pic, has sound, has raster - V6, V7, V20
Has pic, no sound - V8, V9, V10
Overloaded picture - V7

SYNC FAILURE
No vert. sync - V7, V11, V12
No horiz. sync - V11, V13, V14
No vert. or horiz. sync - V11

SWEEP FAILURE
No raster, has sound - V14, V15, V16, V17, V20, Fuse (M1)
No vertical deflection - V7, V12
Poor vert. linearity or foldover - V7, V12
Poor horiz. linearity or foldover - V14, V15, V16
Narrow picture - V14, V15, V16, V17, V18, V19
Vert. off freq. - V7, V11
Horiz. off freq. - V11, V13, V14

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

The high voltage lead should be securely taped and kept away from the chassis. Do not remove the horizontal oscillator to disable the high voltage.

VIDEO IF ALIGNMENT

Connect the negative lead of a 2 volt bias supply to the ungrounded side of C32. Connect the positive lead to chassis.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	470MMFD	High side to pin 1 (grid) of 6CB6 (V5). Low side to chassis.	43MC (10MC Swp)	39.75MC 45.75MC	Any non-interfering channel.	Vert. amp. thru 10KΩ to point Ⓐ. Low side to chassis.	A1, A2	Attenuate generator output to maintain not more than 3 volts peak to peak on scope. Adjust for response of maximum amplitude and symmetry as in fig. 1.
2.	"	High side to point Ⓑ. Low side to chassis.	"	39.75MC 41.25MC 47.25MC	"	"	A3 A4 A5	Remove bias battery. Use maximum scope gain to amplify trap region of response curve as in fig. 2. Adjust for minimum marker amplitude. Reconnect bias supply.
3.	"	"	"	42.75MC 45.0MC 45.75MC	"	"	A6, A7, A8, A9	Attenuate sweep generator output to maintain not more than 3 volts peak to peak on scope. Alternately adjust A6 thru A9 for response similar to fig. 3. A6 affects the low side and A7 affects the high side of the response curve

OSCILLATOR ALIGNMENT

The master oscillator adjustment of A10 is to be made only if the individual channel oscillator adjustment fails to bring the channels within the range of the fine tuning control. If channels 2 thru 6 fall within the range of the fine tuning control, but the higher channels do not, slight adjustment of A10 may be necessary to bring in the higher channels.
Connect the negative lead of the bias supply to the ungrounded side of C32. Connect the positive lead to chassis. Adjust for -1 volt at C32.
Turn up the scope gain so that the sound trap notch in the response curve becomes visible.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Set the fine tuning control to the mid-position of its range.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
4.	Two 120Ω carbon resistors	Across antenna terminals with 120Ω in each lead.	57MC (10MC Swp)	59.75MC	2	Vert. amp. thru 10KΩ to point Ⓐ. Low side to chassis.	A11	Adjust to place sound marker in trap notch as in fig. 4.
			63MC (10MC Swp)	65.75MC	3		A12	
			69MC (10MC Swp)	71.75MC	4		A13	
			79MC (10MC Swp)	81.75MC	5		A14	
			85MC (10MC Swp)	87.75MC	6		A15	
			177MC (10MC Swp)	179.75MC	7		A16	
			183MC (10MC Swp)	185.75MC	8		A17	
			189MC (10MC Swp)	191.75MC	9		A18	
			195MC (10MC Swp)	197.75MC	10		A19	
			201MC (10MC Swp)	203.75MC	11		A20	
			207MC (10MC Swp)	209.75MC	12		A21	
			213MC (10MC Swp)	215.75MC	13		A22	

RF AND MIXER ALIGNMENT

Remove the bias supply from C32 and connect a jumper from the tuner AGC lead (yellow) to chassis.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
5.	Two 120Ω carbon resistors	Across antenna terminals with 120Ω in each lead.	69MC (10MC Swp)	67.25MC 71.75MC	4	Vert. amp. thru 10KΩ to point Ⓒ. Low side to chassis.	A23, A24 A25	Adjust for response similar to fig. 5.
6.	"	"	201MC (10MC Swp)	199.25MC 203.75MC	11	"	A26, A27, A28	Adjust A26 and A27 for symmetrical response similar to fig. 6. Adjust A28 for proper band width. Repeat steps 5 and 6 until best overall symmetrical response is obtained. Remove jumper from tuner AGC terminal to chassis.

FIG. 1

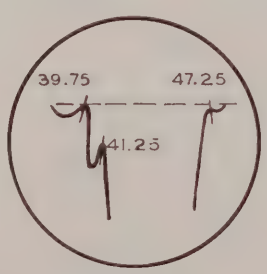

FIG. 2

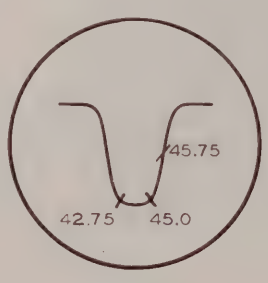

FIG. 3

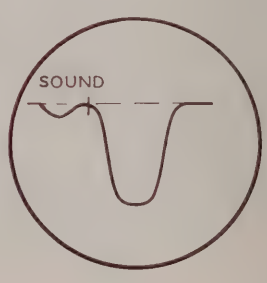

FIG. 4

ALIGNMENT INSTRUCTIONS (cont)

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SOUND IF ALIGNMENT

Connect an attenuator (Zenith part #S-17203 or equivalent) in series with the receiver antenna.
Tune in a tone modulated TV signal and adjust the attenuator until the signal falls below the limiting level of the 6BN6 limiter detector, as evidenced by a hiss similar to superregeneration.
Adjust the sound take-off transformer (A29-A30), the sound IF transformer (A31) and the quadrature coil (A32) for maximum sound of best quality.
Adjust the buzz control (R8) for minimum intercarrier buzz.
If the intercarrier buzz cannot be eliminated with the buzz control, check the setting of the AGC delay adjustment.
If during the sound IF alignment the signal rises above the limiting level (hiss disappears) increase the attenuation until the hiss returns.

UHF TUNER ASSIGNMENT

Alignment of the UHF tuner should not be attempted unless proper test equipment is available.
Switch the receiver to UHF position.
Connect the negative lead of a 2 volt bias supply to the ungrounded side of C32. Connect the positive lead to chassis.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Adjust sweep generator output to provide 3 volts peak to peak on scope.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
7	Fig. 8	Across UHF antenna terminals thru matching network (fig. 8).	713MC (10MC Swp)	711.25MC	54	Vert. amp. thru 10KΩ to point (A) . Low side to chassis.	A33, A34, A35	Tuner rocker arm should be in the horizontal position. If necessary, loosen set screw and adjust tuner shaft so that rocker arm is horizontal when the channel indicator is set to channel 54. Do not adjust A33 unless oscillator calibration is off more than 3 channels. If necessary, adjust A33 to place video marker at 50% on the response curve as in fig. 7. The image (weaker response) will appear also The response toward the counter clockwise position of A33 is the proper response. Adjust A34 and A35 for maximum amplitude and symmetry of response similar to fig. 7.
8	"	"	473MC (10MC Swp)	471.25MC	14	"		Check for response similar to fig. 7. If oscillator is off more than 3 channels, adjust the oscillator travel (osc., mixer and antenna travel adjustments are the three round thumb screws on top of tuner) adjustment to scale. Care must be used in making this adjustment so as not to move the rocker arm out of its bearing. Set the mixer and antenna travel adjustments for maximum response on scope.
9	"	"	887MC (10MC Swp)	885.25MC	83	"	A36, A37, A38	Adjust A36 to place marker at 50% as in fig. 7. Adjust A37 and A38 for maximum amplitude and symmetry of response similar to fig. 7.

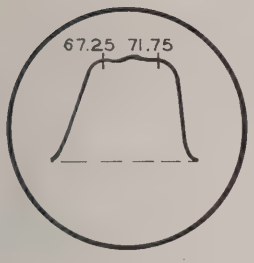


FIG.5

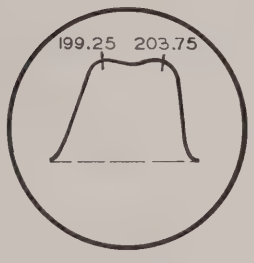


FIG.6

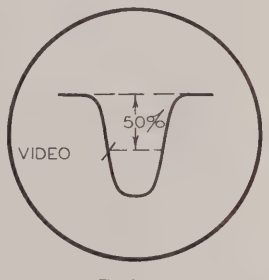


FIG.7

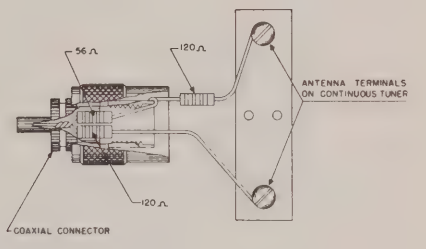
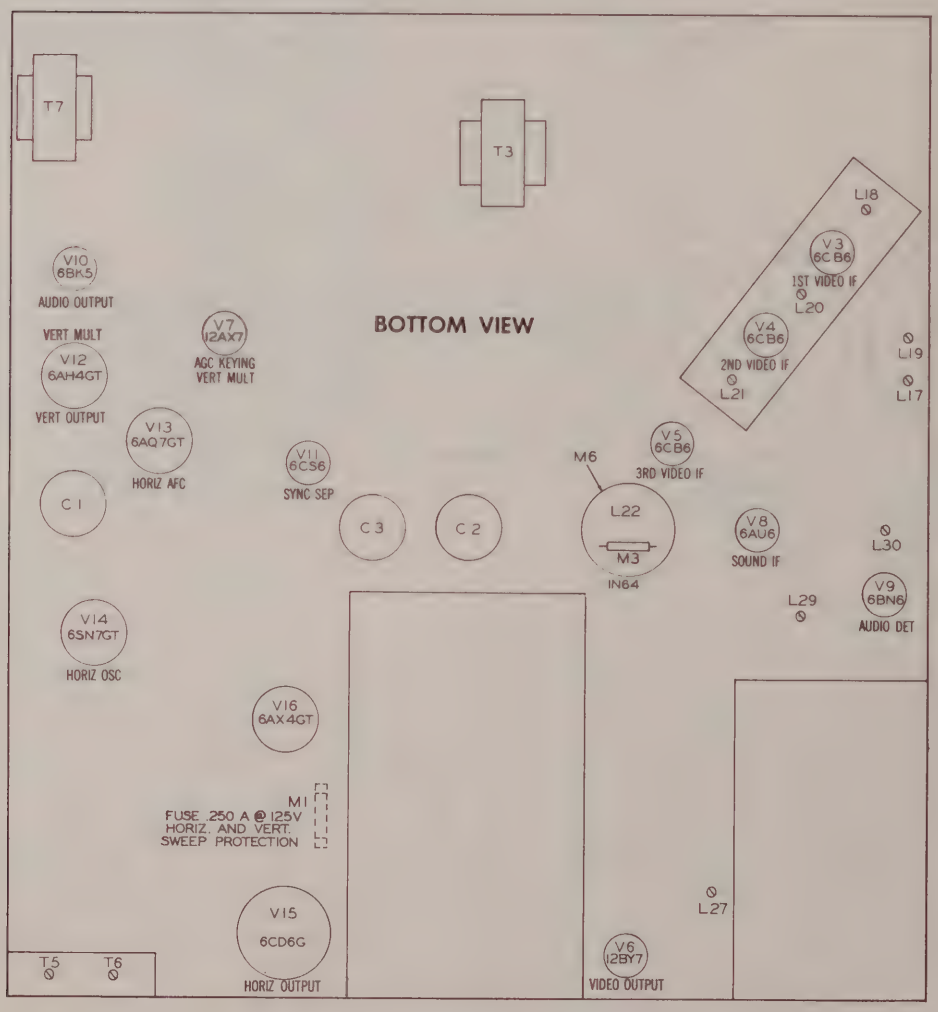


FIG.8

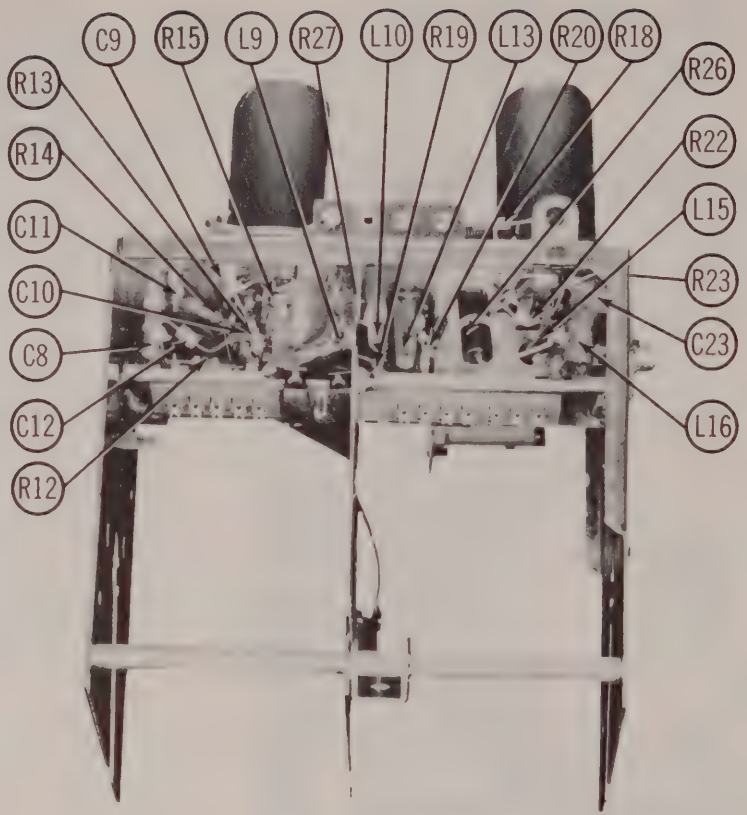
RESISTANCE MEASUREMENTS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6BK7A	†765Ω	70KΩ	INF.	.1Ω	0Ω	INF.	3.2Meg	47Ω	0Ω
V 2	6U8	10KΩ	68KΩ	†100KΩ	.1Ω	0Ω	†300Ω	0Ω	2.2KΩ	4.4KΩ
V 3	6CB6	1.1Meg	500Ω	.1Ω	0Ω	■470Ω	■470Ω	0Ω		
V 4	6CB6	80KΩ	■15Ω	.1Ω	0Ω	†550Ω	†550Ω	80KΩ		
V 5	6CB6	270Ω	420Ω	.1Ω	0Ω	†8.2KΩ	†8.2KΩ	0Ω		
V 6	12BY7	15Ω	2.7KΩ	15Ω	0Ω	0Ω	.1Ω	†5.6KΩ	†22KΩ	15Ω
V 7	12AX7	▲2.5Meg	190KΩ	60KΩ	0Ω	0Ω	680KΩ	3.9KΩ	10KΩ	.1Ω
V 8	6AU6	100KΩ	0Ω	.1Ω	0Ω	†33KΩ	†33KΩ	0Ω		
V 9	6BN6	200Ω	.3Ω	.1Ω	0Ω	†22KΩ	220KΩ	†330KΩ		
V 10	6BK5	†1KΩ	INF.	100KΩ	.1Ω	0Ω	100Ω	100KΩ	†550Ω	INF.
V 11	6CS6	15KΩ	0Ω	.1Ω	0Ω	†170KΩ	†47KΩ	†1.1Meg		
V 12	6AH4GT	1.1Meg	.1Ω	1.8Meg	INF.	765Ω	INF.	0Ω	1.9KΩ	
V 13	6AQ7GT	2Meg	1Meg	0Ω	3Meg	†47KΩ	470Ω	.1Ω	0Ω	
V 14	6SN7GT	47KΩ	▲250KΩ	0Ω	32KΩ	†75Ω	10KΩ	.1Ω	0Ω	
V 15	6CD6G	INF.	0Ω	68Ω	INF.	680KΩ	680KΩ	.1Ω	†7KΩ	Top Cap ▲8Ω
V 16	6AX4GT	1.5Ω	INF.	200KΩ	200KΩ	†95Ω	†95Ω	.1Ω	0Ω	
V 17	1B3GT	PINS 1	THROUGH	8 HAVE	INFINITE	RESISTANCE				Top Cap ▲268Ω
V 18	5U4G	INF.	25KΩ	INF.	13Ω	INF.	12Ω	INF.	25KΩ	
V 19	5U4G	INF.	25KΩ	INF.	13Ω	INF.	12Ω	INF.	25KΩ	
V 20	21EP4B	0Ω	100KΩ	Pin 10 ▲68KΩ	Pin 11 †300KΩ	Pin 12 .1Ω				

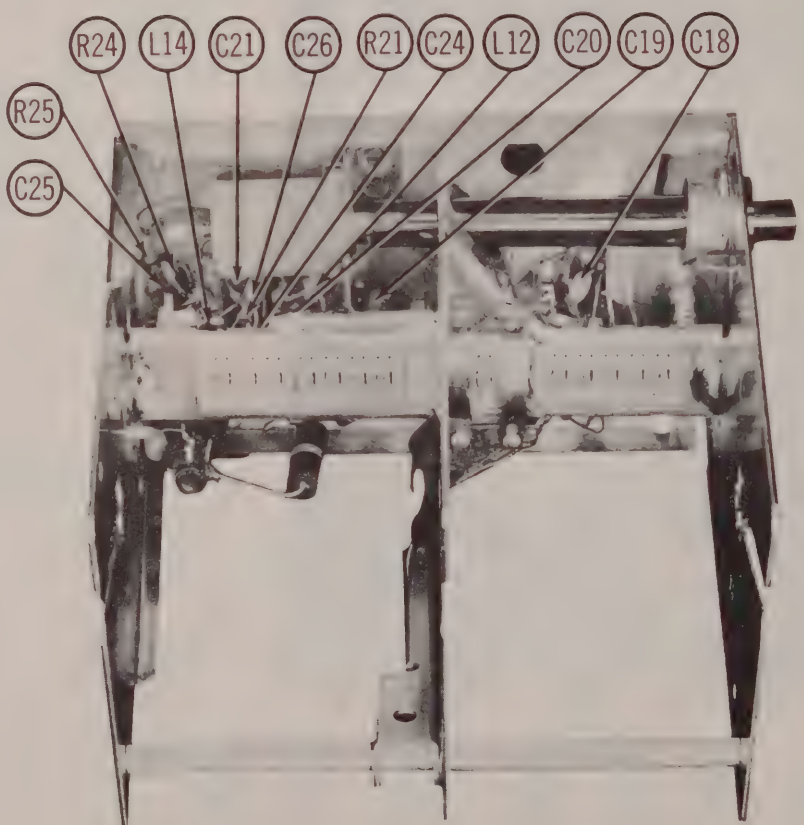
† MEASURED FROM PIN 2 OF V19.
■ MEASURED FROM PIN 7 OF V4.
▲ MEASURED FROM PIN 3 OF V16.



TUBE PLACEMENT CHART



RF TUNER-RIGHT SIDE



RF TUNER-LEFT SIDE

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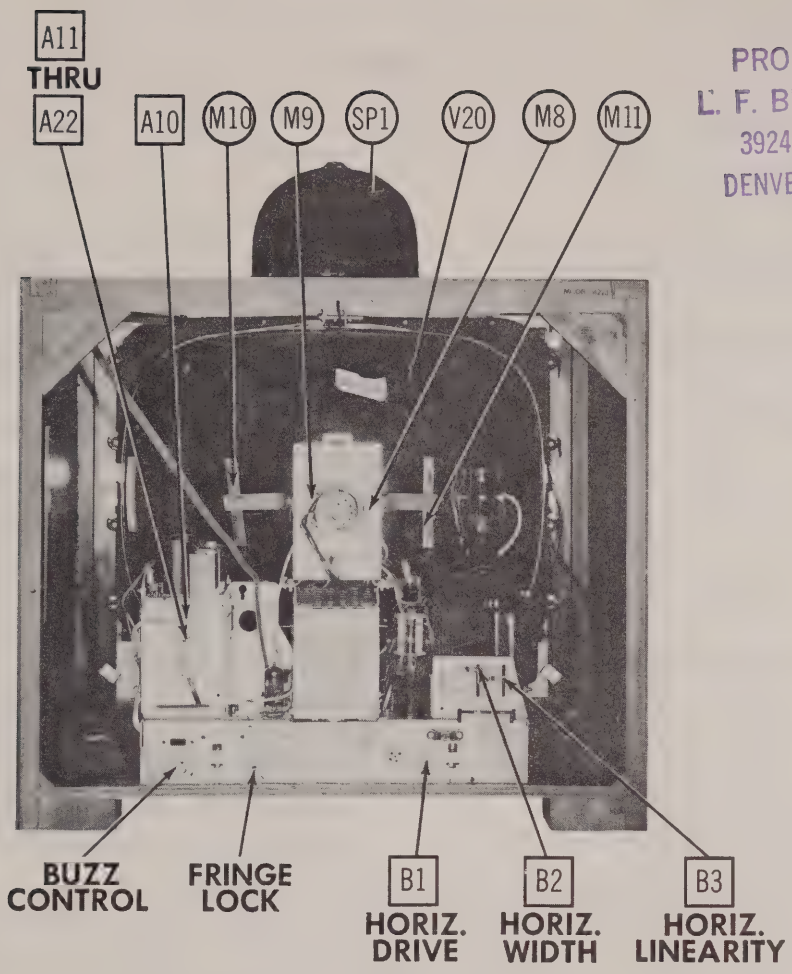

CABINET—REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Turn the set on and tune in a TV station, preferably a test pattern.

Set the horizontal hold adjustment until the picture synchronizes horizontally.

Adjust the horizontal drive trimmer (B1) for greatest picture width. Adjust the width slug (B2) for a picture slightly wider than necessary to fill the picture mask horizontally.

Adjust the horizontal linearity slug (B3) for a picture that is symmetrical from left to right.

AGC DELAY

Connect the vertical amplifier of an oscilloscope thru a 10KΩ resistor to point (A). Low side to chassis.

Select the strongest TV signal available and adjust the AGC delay control for 2.75 volts peak output.

Satisfactory adjustment may also be obtained by turning the AGC delay control fully clockwise, then counter clockwise until picture distorts and buzz is heard in the sound. Turn AGC delay control slowly clockwise until a stable picture with clear sound is obtained.

TROUBLE SHOOTING AIDS

SWEEP

HORIZONTAL

LOSS OF SWEEP

Follow procedure outlined under "Loss of High Voltage".

INSUFFICIENT SWEEP

Check adjustments B1, B2 and B3. Check by substitution V15, V16, V18 and V19. Check R105, R106, T2, T4A and other associated components.

DRIVE LINES

Check by substitution V15 and V16. Check adjustments B1 and B3. Check C83, C82, R105, R106, R104, T2, T4A and other associated components.

COMPRESSED LEFT SIDE

Check by substitution V15 and V16. Check horizontal output and damper stages for component failure or change of value.

FOLDS

Follow procedure outlined under "Drive Lines".

PIE CRUST EFFECT

Check by substitution V13, V14, V15 and V16. Check C76 for open. Check L31, C79, C81, R98 and other associated components.

XMAS TREE EFFECT

Check by substitution V13, V14, V15 and V16. Check T2 and T4A for internal arcing. Check R95, R98, C83, C80, C78, C79, L31 and other associated components.

VERTICAL

LOSS OF SWEEP

Check by substitution V7 and V12. Check waveform W10.

If Satisfactory	If Unsatisfactory
Check T3, T4B, R84, R82, C2B, C69, C2D and other associated components.	Check C63, C68, C62, R3 and other associated components.

INSUFFICIENT SWEEP

Check by substitution V7 and V12. Check height and vertical linearity controls for proper operation. Check T3 and T4B.

COMPRESSED AT BOTTOM

Check by substitution V7 and V12. Check R3, R77, R110 and other associated components.

COMPRESSED AT TOP

Check by substitution V7 and V12. Check R82, R5, C2D, T3 and other associated components.

FOLDS

Check by substitution V7 and V12. Check R79, R82, C84, T3, T4B and other associated components.

SYNC

LOSS OF VERTICAL AND HORIZONTAL SYNC

Substitute V11. Check C59, R71, R72, C3A and other components associated with V11.

LOSS OF VERTICAL SYNC-HORIZONTAL SYNC SATISFACTORY

Check by substitution V11 and V7. Check C61, M12, C62, R4, R73 and other associated components.

LOSS OF HORIZONTAL SYNC-VERTICAL SYNC SATISFACTORY

Substitute V13. Check C71, C76, C77, R94, R95, L31 and other associated components.

HORIZONTAL BENDING

Check by substitution V7, V11, V13 and V14. Check horizontal AFC network.

VIDEO

LOSS OF VIDEO

Substitute V6. Check C2C, C46, C47, R47, R50, R51 and other associated components.

SOUND BARS (4.5 MC BEAT)

Adjust tuner fine tuning for best sound and picture. Check video IF alignment.

POOR CONTRAST

Substitute V6. Check picture tube, contrast control, L28, L25, C46, R44 and other components associated with V6.

NEGATIVE PICTURE

Substitute V6. Check picture tube, C46 and C45. Check video crystal detector network and other associated components.

SMEAR

Substitute V6. Check L25, L26, L28, C47 and other associated components.

WIDE BLACK BAR ACROSS PICTURE

Check by substitution V1, V3, V4, V5 and V6 for heater to cathode leakage.

AUDIO

WEAK OR NO SOUND

Check by substitution V8, V9 and V10. Check stage V10 using audio signal generator. Apply audio signal across R1.

If Satisfactory	If Unsatisfactory
Check audio IF and audio detector network for component failure or change of value.	Check C57, C3C, C58, R69, R67, T7, speaker and other associated components.

BUZZ

Adjust tuner fine tuning for best sound and picture. Check adjustments R8 and A32 for minimum buzz. If still unsatisfactory, check audio IF alignment.

DISTORTED

Follow procedure outlined under "Weak or No Sound".

POWER

DEAD SET

If filaments fail to light, check AC interlock assembly. Check switch on volume control and T1. If filaments light, check by substitution V18 and V19. Check B+ filter and decoupling network.

SMALL AND/OR DIM PICTURE

Check by substitution V18 and V19. Check B+ filter and decoupling network.

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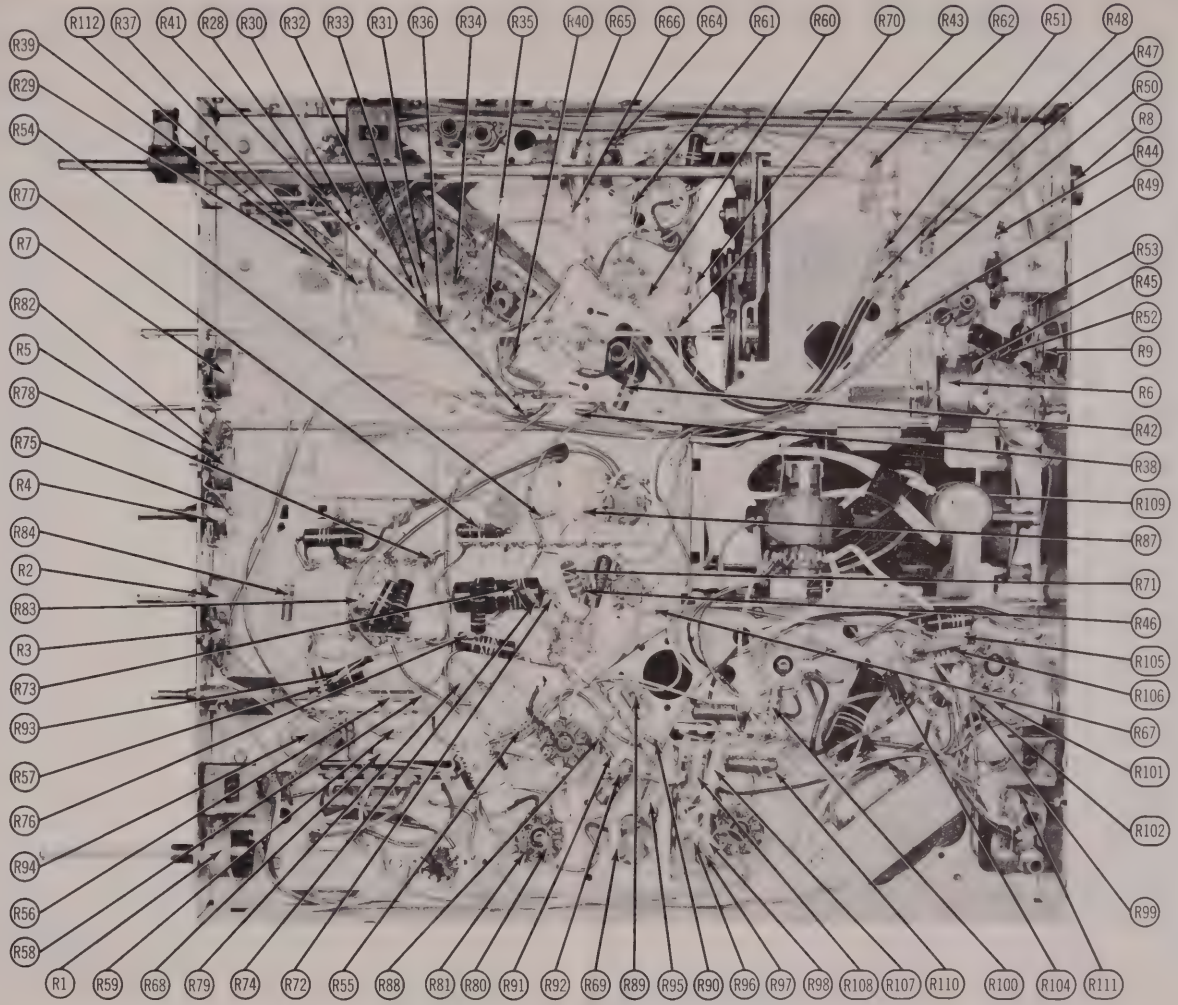
ZENITH MODELS M2237EU, EZ, R, RU, RZ, M2260R, RU, RUZ, RZ, M2261E, EU, EZ, M2267YU, YZ (Ch. 20M20, U, Z)

ALTERNATE UHF-VHF TUNER SCHEMATIC

UHF IF STRIP
UHF IF STRIP
IF OUTPUT
MIXER A 6U8
OSC B 6U8
UHF OSC 6AF4
RF AMP 6BK7A
225V
AGC JUNCTION R29 AND C50
FINE TUNING
THRU
CHANNEL BRACKET
CATH
GRAMICK
VHF - UHF TUNER USED IN SOME VERSIONS
A PHOTOFACT STANDARD NOTATION SCHEMATIC
© Howard W. Sams & Co., Inc. 1951
WHEN USING SEPARATE UHF-VHF ANT., DISCONNECT SWITCH LEADS HERE AND CONNECT VHF ANT. TO THESE TERMINALS.
UHF-VHF CHANGE-OVER SWITCH SHOWN IN VHF POSITION
TO BE USED WHEN A COMMON UHF-VHF ANT. IS USED. WHEN SEPARATE ANTENNAS ARE USED CONNECT THE UHF ANT. TO THESE TERMINALS.



CHASSIS BOTTOM VIEW-RESISTOR IDENTIFICATION

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DEN[illegible]

PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA, GENERAL ELECTRIC, WESTINGHOUSE)

ITEM No.	USE	REPLACEMENT DATA: ZENITH PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RETMA BASE TYPE	NOTES
V1	RF Amp.	6BK7A	6BK7A	9AJ	
V2	Mixer-Osc.	6U8	6U8	9AE	
V3	1st Video IF Amp.	6CB6	6CB6	7CM	
V4	2nd Video IF Amp.	6CB6	6DG6	7CM	
V5	3rd Video IF Amp.	6CB6	6CB6	7CM	
V6	Video Output	12BY7	12BY7	9BF	
V7	AGC Keying				
	Vert. Mult.	12AX7	12AX7	9A	
V8	Sound IF Amp.	6AU6	6AU6	7BK	
V9	Audio Det	6BN6	6BN6	7DF	
V10	Audio Output	6BK5	6BK5	9BQ	
V11	Sync Sep.	6CS6	6CS6	7CH	
V12	Vert. Mult.				
	Vert. Output	6AH4GT	6AH4GT	8EL	
V13	Horiz. AFC	6AQ7GT	6AQ7GT	8CK	
V14	Horiz. Osc. - Horiz. Discharge	6SN7GT	6SN7GT	8BD	
V15	Horiz. Output	6CD6G	6CD6G	5BT	
V16	Damper	6AX4GT	6AX4GT	4CG	
V17	HV Rect.	1B3GT	1B3GT	3C	
V18	LV Rect.	5U4G	5U4G	5T	
V19	LV Rect.	5U4G	5U4G	5T	

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CATHODE-RAY TUBE

ITEM No.	REPLACEMENT DATA: ZENITH PART No.	CBS-HYTRON PART No.	GENERAL ELECTRIC PART No.	SYLVANIA PART No.	WESTINGHOUSE PART No.	RETMA BASE TYPE	NOTES
V20	21EP4A 21EP4B	21EP4A 21EP4B	21EP4A 21EP4B	21EP4A 21EP4B 21EP4 ①	21EP4A 21EP4B	12N 12N 12D	① Circuit changes necessary.

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: ZENITH PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C1A	■40	400	22-2437	AFH3-46		C037		FP378	TVL-3792	
B	▲80	400							TVA-1709	
C	▲30	400								
C2A	▲10	475				D143		FP454.6	TVL-4805	
B	■40	400	22-2479	E4D641						
C	▲4	350								
D	100	50								
C3A	■4	350				A029		FP326.8		
B	▲100	25	22-2478	E3C466		BR435			TVL-3603	Note 7
C	40	25								
C4	40		22-2519							
C5	40		22-2519							
C6	40		22-2519							
C7	40		22-2519							
C8	2.5-6		22-2221							
C9	400		22-2404							
C10	800		22-2331	BPD-0008	DD-801	K067	801-0008	UC-538	5GA-T8	
C11	400		22-2404							
C12	2.2		22-2468	SI2.2NP0	TCZ-2.2	TZ05	NP0K-2R2		5TCCB-V22	
C13	400		22-2404							
C14	800		22-2577							
C15	400		22-2404							
C16	.85-2.3		22-2453							
C17	.6-3		22-2504							
C18	800		22-2331	BPD-0008	DD-801	K067	801-0008	UC-538	5GA-T8	
C19	100		22-2407	SI100	D6-101	TP34	GP1K-101	UC-531	5GA-T1	
C20	19		22-2406							
C21	2		22-2536	SI2.2NP0	TCZ-2.2	TZ05	NP0K-2R2		5TCCB-V22	
C22	400		22-2404							
C23	2		22-2536							
C24	4.5		22-2500							
C25	10		22-2411	SI10NP0	TCZ-10	TP09	NP0K-100	ZT-541	5TCC-Q1	
C26	5.5		22-2449							
C27	400		22-2404							
C28	470		22-2217	SI470	D6-471	TP46	GP2K-471	UC-5347	5GA-T47	
C29	6		22-2381							
C30	9		22-2514							
C31	24		22-2515		TCZ-24	TZ15	NP0L-240	ZT-5425	5TCC-Q25	
C32	.1	200	22-1777	P288-1	DF-104	PJ2P1		PT401	2TM-P1	
C33	330		22-2309		TCZ-331					
C34	1000		22-7	BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C35	1000		22-7	BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C36	470		22-2302		TCZ-471					
C37	1000		22-7	BPD-001	DD-102	K069	801-001	DC-521	5HK-D1	
C38	470		22-6	BPD-00047	DD-471	K060	801-00047	UC-5347	5GA-T47	
C39	1000		22-2112							
C40	470	500	22-2524	1469-0005		5R5T47		MCE-245	MS-35	
C41	470		22-2217		TCZ-471					
C42	4.5		22-2522							
C43	7		22-2375							
C44	270		22-2477		TCN-270	TN32	N750-337-271			
C45	.033	200	22-1840	P288-033		PJ2S33		PT4133	2TM-S33	
C46	47		22-2467							
C47	.1	200	22-1777	P288-1	DF-104	PJ2P1		PT401	2TM-P1	
C48	10000		22-3	BPD-01	DD-103	K082	811-01	DC-511	5HK-S1	
C49A	1000	}	22-2545	BPD-2X001	DD2-102	DK069	812-001	DCD-521	5HK-2D1	
B	1000	}								
C50	.01	200	22-3	P288-01	D6-103	PJ2S1	GP2-333-103	PT411	2TM-S1	
C51	3.3		22-2343			TZ06				
C52	50		22-2460			TP30				
C53A	1000	}	22-2553	BPD-2X001	DD2-102	DK069	812-001	DCD-521	5HK-2D1	
B	1000	}								

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PARTS LIST AND DESCRIPTIONS (Continued)

CAPACITORS (cont)

ITEM No	RATING CAP	RATING VOLT	ZENITH PART No	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C54	680		22-2320	SI680	D6-681	TP50	GP2K-681	UC-5368	5GA-T68	
C55	10		22-2378							
C56	.047	200	22-1778	P286-047	DF-503	PJ2847		PT4147	2TM-S47	
C57	10000		22-3	BPD-01	DD-103	K082	811-01	DC-511	5HK-81	
C58	.0068	600	22-2368							Note 1
C59	.0033	600	22-1765							
C60	27		22-2396			TZ16				
C61	.0022	600	22-1843	P288-0022	D6-222	CUB4D22	GP2-333-222	PT6222	6TM-D22	
C62	.33	200	22-2167	P286-33		PJ2F33		PT2033	2TM-P33	Note 2
C63	.1	600	22-1841	P288-1	DF-104	CUB4P1		PT601	6TM-P1	
C64	.023	400	22-2129							
C65	.01	600	22-2545							Note 6
C66	.01	600	22-2545							
C67	.033	200	22-2510							
C68	.0022	600	22-1844							
C69	.033	200	22-1840	P288-033		PJ2S33		PT4133	4TM-S33	
C70	.01	400	22-1846	P488-01	D6-103	CUB4S1	GP2-333-103	PT401	4TM-S1	
C71	100	500	22-1412	1469-0001		MCE225		MC225	MS-31	
C72	130	500	22-2505	1469-0001		33R5T12		MCE235	MS-31	
C73	.001	200	22-1838	P286-001	D6-102	CUB5D1	GP2-333-102	PT501	5TM-D1	
C74	.0047	200	22-1842							
C75	.15	200	22-2168							
C76	.001	200	22-1839	P488-001	D6-102	CUB5D1	GP2-333-102	PT621	6TM-D1	
C77	.1	200	22-1777	P288-1	DF-104	PJ2P1		PT401	2TM-P1	
C78	680	500	22-2125	1469-0007		1R5T68				
C79	1000	500	22-2183	1464-001		1R5D1		MCE255	MS-21	
C80	.0015	400	22-1765	P488-0015	D6-152	CUB4D15	GP2-333-152	PT6215	4TM-D15	
C81	1000		22-3122							
C82	680		22-2387	SI680MP0	TCZ-681	TM68	MP0K-681			
C83	330		22-2309	SI330MP0	TCZ-331	TM34	MP0K-331			
C84	.0047	400	22-1775	P488-0047	D6-472	CUB4D47	GP2-333-472	PT6347	4TM-D47	Note 3
C85	.15	400	22-2341							
C86	.1	400	22-2340	P488-1	DF-104	CUB4P1		PT401	4TM-P1	
C87	82	2000							30GA-Q82	
C88	.0047	600	22-1849							
C89	18		22-2341							Note 4
C90	4000		22-4	BPD-004	DD-402	K078	801-004	DC-526	5HK-D4	
C91	.015	200	22-3	P288-015		PJ2S15		PT4315	2TM-S15	
C92	.01		22-3							Note 5

Note 1. Some versions may use a .001MFD @ 600V in this application.
Note 2. Some versions may use a .22MFD @ 100V in this application.
Note 3. Some versions may use a .047MFD @ 400V in this application.
Note 4. Not used in all versions.
Note 5. Used in chassis 20M20Z and 20M20YZ only.
Note 6. Some models may use a dual disc of 10000MMF in this application.
Note 7. CSB is not used.

CONTROLS

ITEM No	RATING RESISTANCE	RATING WATTS	ZENITH PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	500KΩ		63-2911	Q13-133	A47-500K-Z	AB-60	U-48	Volume
B	Shaft		Not Req.	C-3	KSB-5	AK-4	Not Req.	Attach to R1A
C	Switch		Not Req.	76-1	SWE-12	KB-1	US-26	Attach to R1A
R2A	200KΩ	½	63-2237	Q11-129	A47-200K-B	AB-66	U-43	Brightness
B	Shaft		Not Req.	Not Req.	KSB-3	AK-4	Not Req.	Attach to R2A
R3A	10Meg	½	63-2346	Q11-143	A47-10Meg-S	AB-98	U-82	Height - Note 1
	with 1Meg atap							
B	Shaft		Not Req.	RQ	FKS-1/4	AK-1	Not Req.	Attach to R3A
R4A	75KΩ	½	63-2296	Q11-125	A47-75K-3	AB-35	U-41	Vertical Hold
B	Shaft		Not Req.	Not Req.	KSB-3	AK-4	Not Req.	Attach to R4A
R5A	1500Ω	½	63-2285	WK-1500	WK-1500-S	SU-8	SU-8	Vertical Linearity
B	Shaft		Not Req.	Not Req.	FKS-1/4	AK-1	Not Req.	Attach to R5A
R6A	5000Ω	4	63-2201		A10-5000			Contrast Wire Wound
B	Shaft		Not Req.		KB-3			Attach to R6A
R7A	15KΩ	½	63-2978	Q11-119	A47-15K-S	AB-30	U-26	AGC
B	Shaft		Not Req.	RQ	FKS-1/4	AK-1	Not Req.	Attach to R7A
R8	600Ω	1	63-2187		33-600			Buzz Wire Wound
R9A	7.5Meg	½	63-2219	Q11-142	A47-7.5Meg-S	AB-98	U-82	Fringe Lock
B	Shaft		Not Req.	RQ	FKS-1/4	AK-1	Not Req.	Attach to R9A
R10	1Meg	½	63-3171					Tone - Note 2
R11	500Ω		63-3172					Screen Register - Note 3

Note 1. Connect a 1Meg resistor in series with the right hand terminal of the control and the lead connecting to the same terminal of the original control (control viewed from shaft end, terminals down).
Note 2. Some versions may use an alternate control part no. 63-2825.
Note 3. Some versions may use an alternate control part no. 63-2813.

RESISTORS

ITEM No.	RATING OHMS	RATING WATT	ZENITH PART No.	IRC PART No.	NOTES
R12	47KΩ	½	63-1856	BTS-47K	
R13	470KΩ	½	63-1897	BTS-470K	
R14	27KΩ	½	63-1845	BTS-27K	
R15	47Ω	½	63-1729	BTS-47	
R16	100KΩ	½	63-1869	BTS-100K	
R17	100KΩ	½	63-1869	BTS-100K	
R18	220Ω	½	63-1758	BTS-220	
R19	4700Ω	½	63-1813	BTS-4700	
R20	470Ω	½	63-1773	BTS-470	
R21	68KΩ	½	63-1862	BTS-68K	
R22	100KΩ	½	63-1869	BTS-100K	
R23	82KΩ	½	63-1866	BTS-82K	
R24	2200Ω	½	63-1799	BTS-2200	
R25	2200Ω	½	63-1799	BTS-2200	
R26	10KΩ	2	63-3170	BTB-10K	
R27	22KΩ	½	63-1843	BTS-22K	
R28	68Ω	½	63-1737	BTS-68	
R29	2.2Meg	½	63-1928	BTS-2.2Meg	
R30	56Ω	½	63-1733	BTS-56	
R31	270Ω	½	63-1772	BTS-470	
R32	27KΩ	½	63-1845	BTS-27K	Note 1
R33	680Ω	½	63-1821	BTS-680	
R34	1MΩ	½	63-1708	BTS-1M	
R35	12KΩ	½		BTS-12K	Note 2
R36	180KΩ	½	63-1873	BTS-180K	
R37	120KΩ	½	63-1873	BTS-120K	
R38	47Ω	½	63-1773	BTS-470	
R39	180Ω	½	63-1754	BTS-180	
R40	150Ω	½	63-1750	BTS-150	
R41	2700 5%	½	63-1760	BTS-270 5%	
R42	8200Ω	2	63-1101	BTB-8200	
R43	15KΩ	½	63-1834	BTS-15K	
R44	15Ω	½	63-1708	BTS-15	
R45	68Ω	½	63-1737	BTS-68	
R46	10Meg	½		BTS-10Meg	Note 3
R47	22KΩ	½	63-843	BTS-22K	
R48	100KΩ	½	63-1869	BTS-100K	
R49	100KΩ	½	63-1869	BTS-100K	

RESISTORS (cont)

ITEM No.	RATING OHMS	RATING WATT	ZENITH PART No.	IRC PART No.	NOTES
R50	33KΩ	½	63-1848	BTS-33K	
R51	47KΩ 5%	½	63-1855	BTS-47K 5%	
R52	680Ω	½	63-2190	BTA-680	
R53	220KΩ	½	63-1884	BTS-220K	
R54	68KΩ	½		BTS-68K	Note 4
R55	1900Ω	½	63-1810	BTS-1900	
R56	680KΩ	½	63-1904	BTS-680K	
R57	180KΩ	½	63-2313	BTA-180K	
R58	220KΩ	½	63-1884	BTS-220K	
R59	220KΩ	½	63-1884	BTS-220K	
R60	100KΩ	½	63-1870	BTS-100K	
R61	10KΩ	½	63-1827	BTS-10K	
R62	22KΩ	½	63-3141	BTS-22K	
R63	220KΩ	½	63-1884	BTS-220K	
R64	680Ω	½	63-1779	BTS-680	
R65	330KΩ	½	63-1890	BTS-330K	
R66	1000Ω	½	63-1788	BTS-1000	
R67	100Ω	½	63-1742	BTS-100	
R68	10KΩ	½	63-1828	BTS-10K	
R69	470Ω	1	63-3396	BTA-470	
R70	470KΩ	½	63-1897	BTS-470K	
R71	47KΩ	2	63-3157	BTB 47K	
R72	470KΩ	½	63-1897	BTS 470K	
R73	100KΩ	½	63-1869	BTS 100K	
R74	56KΩ	½	63-1859	BTS-56K	
R75	10KΩ	½	63-1828	BTS-10K	Note 7
R76	150KΩ	½	63-1876	BTS-150K	
R77	47KΩ	½	63-1855	BTS-47K	
R78	100KΩ	½	63-1869	BTS-100K	
R79	22KΩ	½	63-1841	BTS-22K	
R80	1.8Meg	½	63-1912	BTS-1.8Meg	
R81	100Ω	½	63-1743	BTS-100	
R82	470Ω	1	63-2396	BTA-470	
R83	100KΩ	½	63-1869	BTS-100K	
R84	330Ω	1	63-3288	BTA-330	
R85	560Ω	1	63-1775	BTS-560	
R86	560Ω	½	63-1775	BTS-560	
R87	33KΩ	½	63-1849	BTS-33K	Note 5
R88	1Meg	½	63-1901	BTS 1Meg	
R89	1Meg	½	63-1901	BTS 1Meg	
R90	1Meg	½	63-1901	BTS 1Meg	
R91	27KΩ	½	63-1845	BTS-27K	
R92	100Ω	½	63-1744	BTS-100	
R93	470Ω	½	63-1771	BTS-470	
R94	10KΩ	2	63-3145	BTB-10K	
R95	47KΩ	1	63-1194	BTA-47K	
R96	22KΩ	½	63-1843	BTS-22K	
R97	47KΩ	½	63-1856	BTS-47K	
R98	330KΩ	1	63-3194	BTA-330K	
R99	18KΩ	½	63-1838	BTS-18K	
R100	22KΩ	½	63-959	BTS-22K	
R101	680KΩ	½	63-1905	BTS-680K	
R102	100Ω	½	63-1744	BTS-100	
R103	150Ω	2	63-2284	BTB-150	Note 7
R104	68Ω	2	63-2266		
R105	10KΩ	2	63-1198	BTB 10K	
R106	18KΩ	1	63 2207	BTA-18K	
R107	4700Ω	2	63 966	BTB-4700	
R108	4720Ω	2	63-965	BTB 4700	
R109	5.3Ω	1	63-3789		
R110	68KΩ	½		BTS-68K	Note 6
R111	100KΩ	2	63-1870	BTS-100K	
R112	8.5Ω	1	63-3216		
R113	330Ω	½		BTS-330	Note 4

Note 1: Some versions may use a 22KΩ resistor in this application.
Note 2: Some versions may use a 10KΩ resistor in this application.
Note 3: Some versions may use a 15Meg resistor in this application.
Note 4: Not used in chassis 20M20 and 20M20U.
Note 5: Not used in chassis 20M20Z, and 20M20UZ.
Note 6: Chassis 20M20Z, 20M20UZ uses a 33KΩ resistor in this application.
Note 7: Not used in all versions.

TRANSFORMER (POWER)

ITEM No.	RATING PRI.	RATING SEC. 1	RATING SEC. 2	ZENITH PART No.	Stancor PART No	Merit PART No.	Triad PART No	RCA TYPE No.	Halldorson PART No.	Thordorson PART No.
T1	117VAC @2.04A	518VCT .290ADC	5VAC ④6A	85-1311	P-8353					26R33 ③ ⑤
	SEC. 3	SEC. 4	SEC. 5							
	12.6VCT @5.5A									

① Use universal mounting bracket.
② Parallel and phase 5 volt windings for secondary #2.
③ Series 6.3V windings for 12.6VCT for secondary #3.

TRANSFORMERS (SWEEP CIRCUITS)

ITEM No	USE	ZENITH PART No.	Stancor PART No.	Merit PART No.	Triad PART No.	RCA TYPE No	Halldorson PART No.	Thordorson PART No
T2	Horiz. Output Trans.	S-31219 ①	A-8148		A-10EX ③ ⑤			28H75 ⑤ ⑦
T3	Vert. Output Trans.	95-1377						
T4A	Yoke-Horiz. (53MH)	96-1358	DY-9A	MDF-72	Y-17-1	31HD2	DF602	Y-7
B	Vert.(42MH)							
T5	Horiz. Linearity (1.5-2MH)	S-19342	WC-7 ①	MWC-2 ⑤	WC-15 ③ ⑥	207R1 ⑤		WC-18 ⑤ ⑥
T6	Width (4-20MH) (2.4-.53MH)	S-18748						

① Winding and terminal assembly part #S-21261. Tertiary winding and terminal assembly part #S-21264.
② Drill new mounting hole.
③ Use original slider.
④ Connect to coded blue and green terminals.
⑤ Do not use tap.
⑥ Connect as auto transformer.
⑦ Drill one new mounting hole.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	IMPEDANCE SEC.	ZENITH PART No	Stancor PART No.	Merit PART No.	Triad PART No.	Halldorson PART No.	Thordorson PART No.	NOTES
T7	6.6KΩ	3.2Ω	95-1294	A-3878 ①	A-3020	S-9Z	Z1003	26S48	① Drill one new mounting hole.

SPEAKER

ITEM No.	RATINGS SIZE	RATINGS FIELD	RATINGS V	RATINGS C	RATINGS IMP	ZENITH PART No	VIKING PART No	QUAM PART No	NOTES
SP1	5 1.4"	PM	3.2Ω			49-753	525J4	52A1	① Used in Models M2260RU, M2260RZ, M2261UZ, M2261YZ, M2261EU, M2261EZ, M2260R, M2367YU, M2260RUZ
	10"	PM	3.2Ω			49-738 ①	10J11	10A31	

COILS (RF-IF)

ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	ZENITH PART No	MEISSNER PART No	MERIT PART No	TRIAD PART No	NOTES
L1	Series Peaking Trap	0Ω		20-490				
L2	Series Police Trap	0Ω		20-506				
L3	Series Police Trap	0Ω		20-490				
L4	Series Police Trap	0Ω		20-490				
L5	Shunt Police Trap	0Ω		20-506				
L6	Series Police Trap	0Ω		20-490				
L7A	Ant.,RF Grid Coil	0Ω		S-21292				Channel 2
B	Ant., RF Grid Coil	0Ω		S-21293				Channel 3
C	Ant., RF Grid Coil	0Ω		S-21294				Channel 4
D	Ant., RF Grid Coil	0Ω		S-21295				Channel 5
E	Ant., RF Grid Coil	0Ω		S-21296				Channel 6
F	Ant., RF Grid Coil	0Ω		S-19847				Channel 7
G	Ant., RF Grid Coil	0Ω		S-19848				Channel 8
H	Ant., RF Grid Coil	0Ω		S-19849				Channel 9
I	Ant., RF Grid Coil	0Ω		S-19850				Channel 10
J	Ant., RF Grid Coil	0Ω		S-19851				Channel 11
K	Ant., RF Grid Coil	0Ω		S-19852				Channel 12
L	Ant., RF Grid Coil	0Ω		S-19853				Channel 13
L8	Fil. Choke	0Ω		20-391				
L9	Neut.Coil	0Ω		20-431				
L10	RF Coil	0Ω		20-464				
L11A	RF,Mixer Grid,Osc. Coil	0Ω		S-19862				Channel 2
B	RF, Mixer Grid,Osc. Coil	0Ω		S-19863				Channel 3
C	RF, Mixer Grid, Osc. Coil	0Ω		S-19864				Channel 4
D	RF, Mixer Grid, Osc. Coil	0Ω		S-19865				Channel 5
E	RF, Mixer Grid, Osc. Coil	0Ω		S-19866				Channel 6
F	RF, Mixer Grid, Osc. Coil	0Ω		S-19867				Channel 7
G	RF, Mixer Grid, Osc. Coil	0Ω		S-19868				Channel 8
H	RF, Mixer Grid, Osc. Coil	0Ω		S-19869				Channel 9
I	RF, Mixer Grid, Osc. Coil	0Ω		S-19870				Channel 10
J	RF, Mixer Grid, Osc. Coil	0Ω		S-19871				Channel 11
K	RF, Mixer Grid, Osc. Coil	0Ω		S-19872				Channel 12
L	RF, Mixer Grid, Osc. Coil	0Ω		S-19873				Channel 13
L12	Mixer Grid Coil	0Ω		20-485				
L13	Mixer Coil	0Ω		S-20181				
L14	Osc.,Trimmer Coil	0Ω		20-447				
L15	IF Coil	0Ω		S-18859				
L16	Conv. Plate	0Ω		S-20902				
L17	Adj.Sound Trap	0Ω		S-18210	17-4502 *		6225	
L18	1st. Video IF	.1Ω		S-21019			6332	Includes 41.25MC Trap
L19	38.75MC Trap	0Ω		S-20822	17-4501 *		6225	
L20	2nd. Video IF	.1Ω	.1Ω	S-21707			6232 *	
L21	3rd. Video IF	.1Ω	.1Ω	S-19952			6233 *	
L22	4th. Video IF	.2Ω	.2Ω	S-20623				
L23	Series Peaking Coil	5.5Ω		S-17913	19-3160	TV-184	4644	145 Microhenries
L24	Shunt Peaking Coil	5.5Ω		S-21562	19-3160 †	TV-184 †	4644 †	159 Microhenries, wound on an 8.5KΩ resistor
L25	Series Peaking Coil	1.3Ω		S-19138	19-1005		4612	12 Microhenries
L26	RF Choke	1Ω		S-21561	19-6022		4624	16 Microhenries, used in Ch. 20M20, 20M20U, 20M20Z, 20M20UZ.
L27	4.5MC Trap	12Ω	1.2Ω	S-21492				
L28	Series Peaking Coil	5Ω		S-21563	19-3125 *		6153 *	136 Microhenries wound on 8.5KΩ resistor
L29	Sound IF	.3Ω	.3Ω	S-20219	19-3445			

(CONT'D ON NEXT PAGE)

ZENITH MODELS M2237EU, EZ, R, RU, RZ, M2260R, RU, RUZ, RZ, M2261E, EU, EZ, M2267YU, YZ (Ch. 20M20, U, Z)

PARTS LIST AND DESCRIPTIONS (Continued)

COILS (cont)

ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA ZENITH PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	NOTES
L30	Quadrature Coil	4.6Ω		S-19020	20-1004 ▲	TV-151 ▲	1470 ▲	
L31	Horiz. Osc.	152Ω		S-19743	19-1577			Tapped @ 62Ω
L32	RF Choke	.2Ω						Not used in all versions
L33	RF Choke	.2Ω						Not used in all versions

† Use trap winding and drill mounting hole.
■ Detune trap.
† Series with a 5.6KΩ resistor
♦ Parallel with 5.6KΩ resistor.
▲ Drill mounting hole.

FILTER CHOKE

ITEM No.	RATINGS TOTAL DIRECT CURRENT	RATINGS D. C. RESISTANCE	RATINGS INDUCTANCE (0 CURRENT 1000 ∿)	REPLACEMENT DATA ZENITH PART No.	Stancor PART No.	Merit PART No.	Triad PART No.	Halldorson PART No.	Thordarson PART No.
L34	.290ADC	76Ω	2.7 Hy.	95-1348	C-2326 ①		C-17X	C5037	20C55

① Drill one new mounting hole.

FUSES

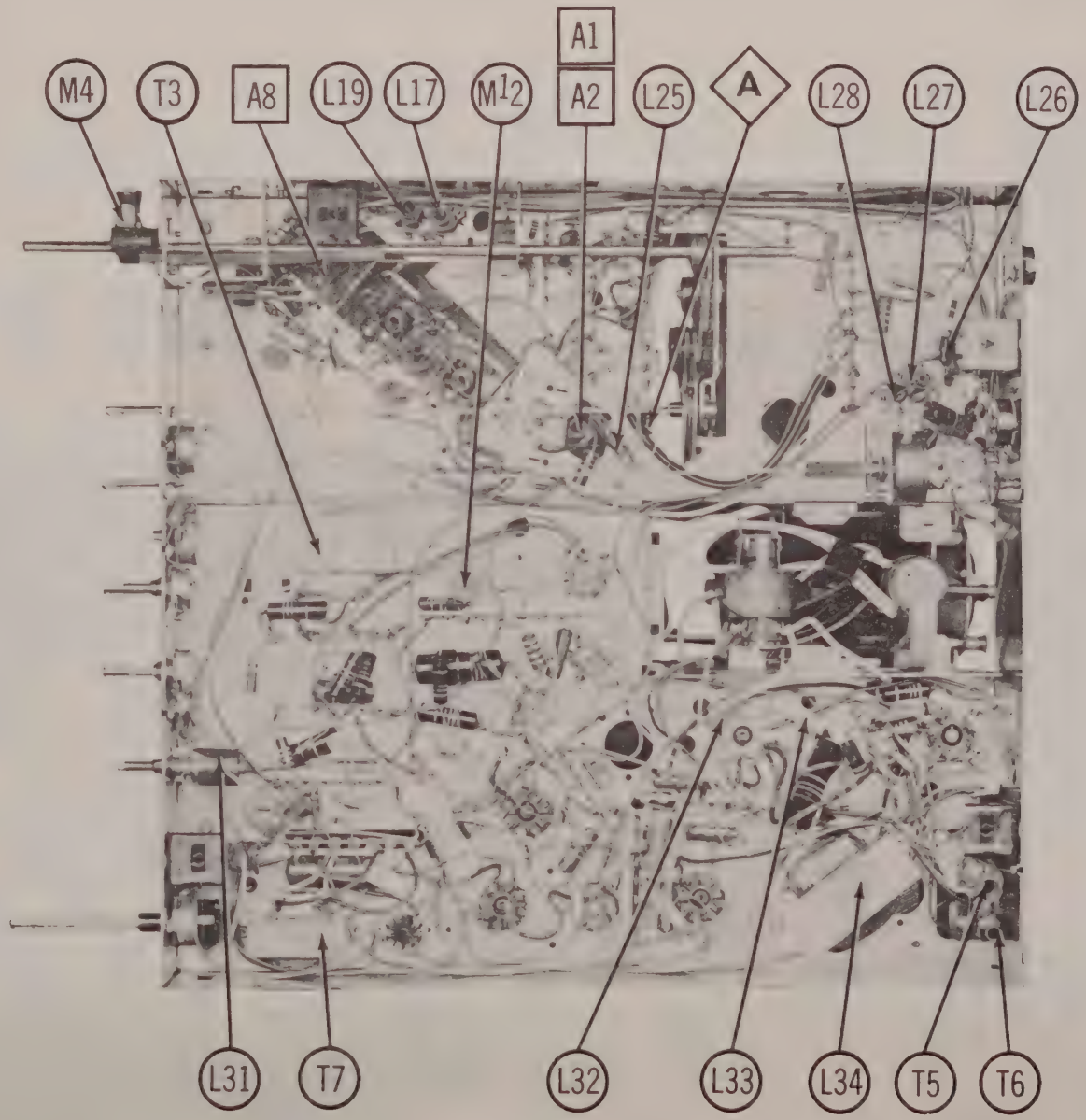
ITEM No.	TYPE	RATING	REPLACEMENT DATA ZENITH PART No. FUSE	ZENITH PART No. HOLDER	LITTELFUSE PART No. FUSE	LITTELFUSE PART No. HOLDER	BUSS PART No. FUSE	BUSS PART No. HOLDER
M1	3AG S/B	1/4A 125V	136-22	83-1883	313-250 (1/4A-3AG-S/B)	357001	MDL 1/4	4405

CRYSTAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA ZENITH PART No.	SYLVANIA PART No.	FEDERAL PART No.	NOTES
M2	CK710	103-15	1N82 or 1N82A		UHF mixer "MU" chassis only
M3	1N64	103-1	1N60 or 1N132	1N60 or 1N64A	Video Det.

MISCELLANEOUS

ITEM No.	PART NAME	ZENITH PART No.	NOTES
M4	Dial Light	100-66	GE #PR12-Clip Type
M5	Tuner	S21060	UHF-VHF Tuner - "M" Chassis
	Tuner	S20989	VHF - "MU" Chassis
	Tuner	S21000	UHF - "MU" Chassis
	Tuner	S19970	12 Position UHF-VHF - "UZ" Chassis
	Tuner	S19670	UHF - UZ Chassis
	Tuner	S19970	12 Position UHF-VHF - "MZ" Chassis
M6	Video Det. Assy.	S21042	Includes M2, L23, L24, L25, C42, C43
M7	Switch	85-546	Change over - UHF-VHF "MU" Chassis
M8	Focus magnet	S-19661	Includes centering device
M9	Ion Trap	S-17461	
M10	Correction magnet	S18763	
M11	Correction magnet	S18763	
M12	Integrator	87-01	
B1	Trimmer cap.	22-2398	Horiz. Drive
	Cabinet	14-1673E	Blond-Models M2237EU, M2237EZ, M2261E, M2261EU, M2261EZ
	Cabinet	14-1673R	Mahogany-Models M2237R, M2237RU, M2237RZ, M2260R, M2260RU, M2260RUZ, M2260RZ
	Cabinet	14-1578Y	Ebony-Models M2267YU, M2267YZ
	Knob	46-1134	On-Off-Volume - Models M2237EU, M2261EU
	Knob	46-1196	On-Off-Volume - Models M2237RZ, M2237R, M2260RZ, M2260R
	Knob	46-1197	On-Off-Volume - Models M2237EZ, M2261EZ, M2261E
	Knob	46-1133	On-Off-Volume - Models M2237RU, M2260RU, M2260RUZ
	Knob	46-1239	On-Off-Volume - Model M2267YU
	Knob	46-1233	On-Off-Volume - Model M2267YZ
	Knob	46-1005	Brightness & Vert. Hold - All models
	Knob	46-1119	Tone & Screen - All models
	Knob	46-1118	Horiz. Hold - All models
	Knob	46-1052	Fine Tuning - All models
	Knob	46-1199	Contrast - All models
	Knob	46-1263	Tuning-UHF, Models M2237EU, M2237RU, M2260RU, M2261EU, M2267YU
	Knob	46-1213	Tuning-UHF-Model M2260RUZ
	Knob	46-1264	Dial-UHF Models M2237EU, M2237RU, M2260RU, M2261EU, M2267YU
	Knob	46-1175	Dial-UHF Model M2260RUZ
	Knob	46-1217	Pull-Models M2237RU, M2237RZ, M2237EZ, M2237R
	Knob	46-1268	Pull - M2237EU
	Knob Assembly	S-21454	Channel Selector - Models M2237RU, M2260RU
	Knob Assembly	S-21455	Channel Selector - M2261EU
	Knob Assembly	S-21456	Channel Selector - M2267YZ
	Knob Assembly	S-20277	Channel Selector - M2237RZ, M2260RZ
	Knob Assembly	S-20328	Channel Selector - M2237EZ, M2261EZ
	Knob Assembly	S-20373	Channel Selector - M2260RUZ
	Knob Assembly	S-20704	Channel Selector - M2267YU
	Knob Assembly	S-21304	Channel Selector - M2237R, M2260R
	Knob Assembly	S-21583	Channel Selector - M2261E
	Knob Assembly	S-21454	Channel Selector - M2237RU
	Safety Glass	192-174	All models



CHASSIS BOTTOM VIEW-TRANS., INDUCTOR AND ALIGNMENT IDENTIFICATION

TROUBLE SHOOTING AIDS (cont)

PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO

HIGH VOLTAGE

LOSS OF HIGH VOLTAGE

Check by substitution V13, V14, V15, V16 and V17. Check M1 fuse. Check waveform W17.

If Satisfactory	If Unsatisfactory
Check T2, T4A, C85, C86, C88, C84, R106, R105, R104 and other associated components.	Check L31, C79, C83, C80, R98, R95 and other associated components.

INSUFFICIENT HIGH VOLTAGE

Check by substitution V15, V16, V18 and V19. Check R106, R105, C84 and other associated components.

BLOOMING

Check by substitution V15, V16, V17, V18 and V19. Check T2, T4A and other associated components.

GENERAL

RASTER, SOUND, NO PICTURE

Follow procedure outlined under "Loss of Video".

RASTER, PICTURE, NO SOUND

Follow procedure outlined under "Weak or No Sound".

RASTER, NO SOUND, NO PICTURE

Check by substitution V1, V2, V3, V4, V5 and V6. Check video IF components for failure or change of value.

NO RASTER, NO SOUND

Follow procedure outlined under "Dead Set".

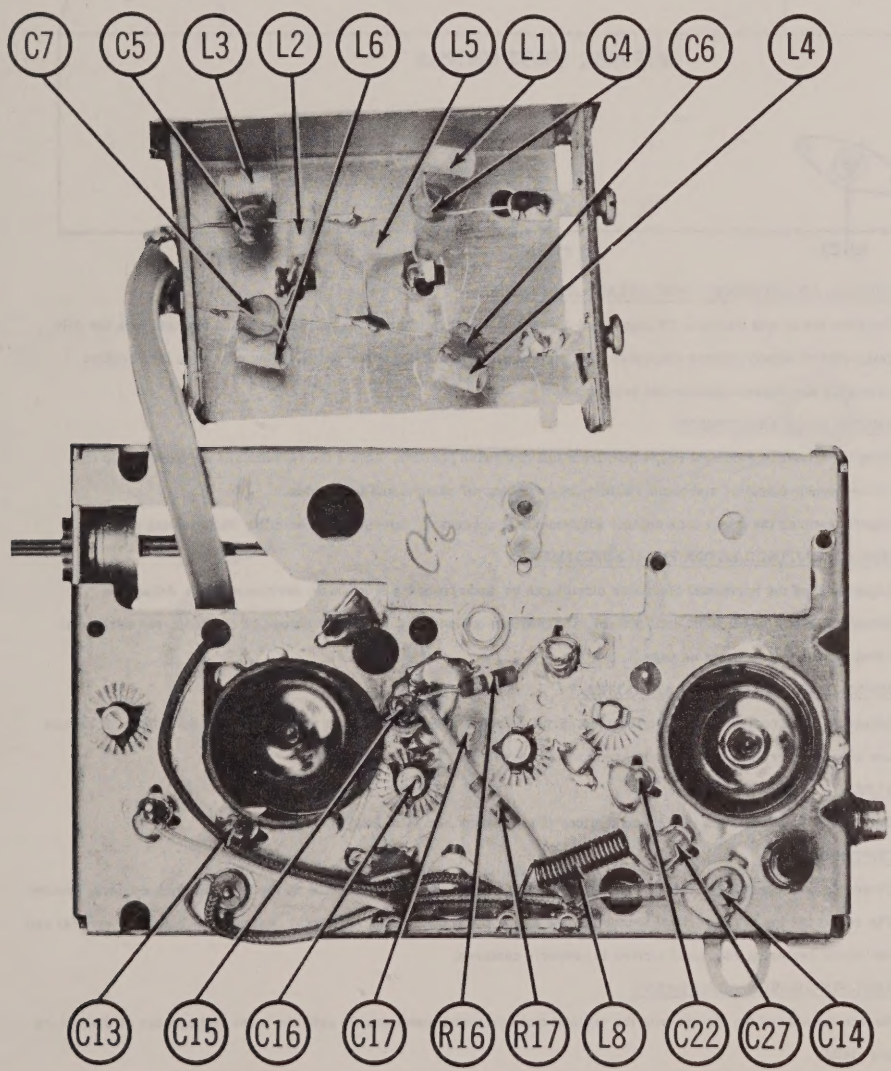
KEYSTONE EFFECT

Check T4 and its associated components.

INTERMITTENT STREAKS

Check high voltage section for corona discharge and arcing.

Symptoms shown are assumed and are not indicative of the quality and workmanship of this equipment.



RF TUNER TOP VIEW

TUNER OSCILLATOR ADJUSTMENTS

Touch-up adjustment of the VHF tuner oscillator circuit. It is necessary to remove rear cover and supply power to set. Adjustments are made thru the hole marked "Bull's Eye Adjustment" and are accessible one at a time as the selector switch is turned to each channel (Fine tuning control must be set to its center of its range before making adjustments). Use alignment wrench 68-21 for adjustments.

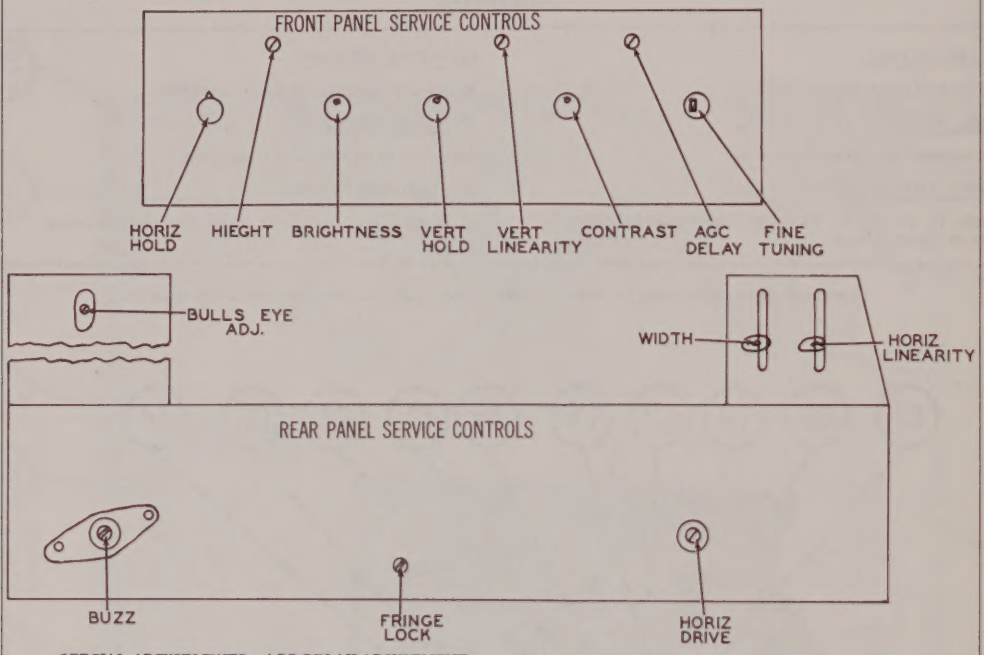
PICTURE TUBE SAFETY GLASS CLEANING

For picture tube safety glass cleaning, it is necessary to remove chassis. (See disassembly instructions.)

PICTURE TUBE REMOVAL

For picture tube removal it is necessary to remove chassis. (See disassembly instructions.)

SERVICE ADJUSTMENT LOCATION



SPECIAL ADJUSTMENTS - AGC DELAY ADJUSTMENT

Turn the set on and tune in a TV signal and observe the picture. Starting from the clockwise position turn the AGC delay control slowly counter clockwise until picture distorts and buzz is heard in the sound. Then turn control clockwise for clearest picture and best sound.

FRINGE LOCK ADJUSTMENT

Turn the fringe lock control to 1/4 turn from full clockwise position. Adjust the vertical and horizontal hold for picture synchronization and check stability by switching off channel and back again.

Slightly retouch the fringe lock control adjustment, if necessary, for maximum stability while testing as above.

HORIZONTAL OSCILLATOR FIELD ADJUSTMENT

Adjustment of the horizontal oscillator circuit can be made from the front panel service control. Adjust the horizontal hold control (L31) until picture synchronizes horizontally. If results cannot be obtained, see horizontal sweep circuit adjustments on page 11.

SOUND IF DETECTOR BUZZ ADJUSTMENT

Adjust the buzz control located on the rear apron of the chassis for maximum volume and minimum buzz. If results are unsatisfactory see alignment instructions on pages 6 and 7.

FUSES

One fuse if used for Horiz. Sweep protection. (For location see Tube Placement Chart.)

CENTERING

Centering is accomplished mechanically by adjusting two centering rods located on the focus magnet mounting bracket. The rod at the top is for vertical centering, the one at the bottom is for horizontal centering. Adjust both vertical and horizontal centering rods until picture is properly centered.

ANTI-PIN CUSHION ADJUSTMENT

Reduce the size of the picture with the vertical and horizontal size controls until the sides and corners of the picture are visible.

If necessary, bend the corrector magnets until the sides of the picture are straight and parallel and the corners of the picture are right angles. Restore the picture to normal size.

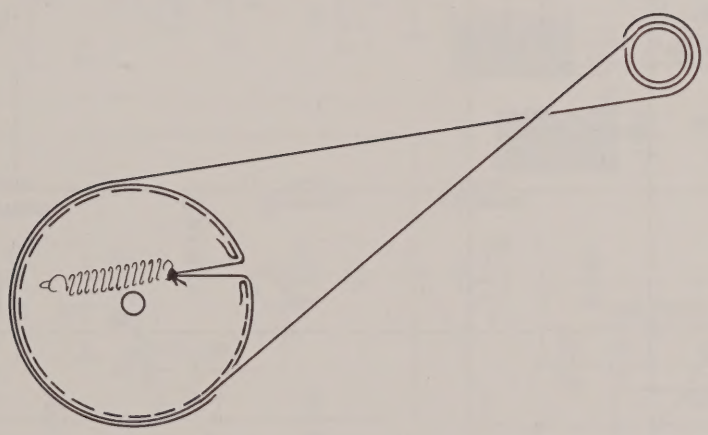
PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO

DISASSEMBLY INSTRUCTIONS

1. Remove 7 push-on type control knobs from front panel.
2. Remove 7 wood screws. Remove rear cover.
3. Disconnect speaker leads. Disconnect tone register. and screen register leads from chassis.
4. Remove 4 chassis bolts, remove chassis.

TO REMOVE SPEAKER

1. Remove two 1/4" metal screws from bottom of speaker housing.
2. Remove one screw from housing knob, remove knob and housing.
3. Remove four speaker nuts, remove speaker.



FINE TUNING – FULLY COUNTERCLOCKWISE

FINE TUNING DRIVE CORD STRINGING